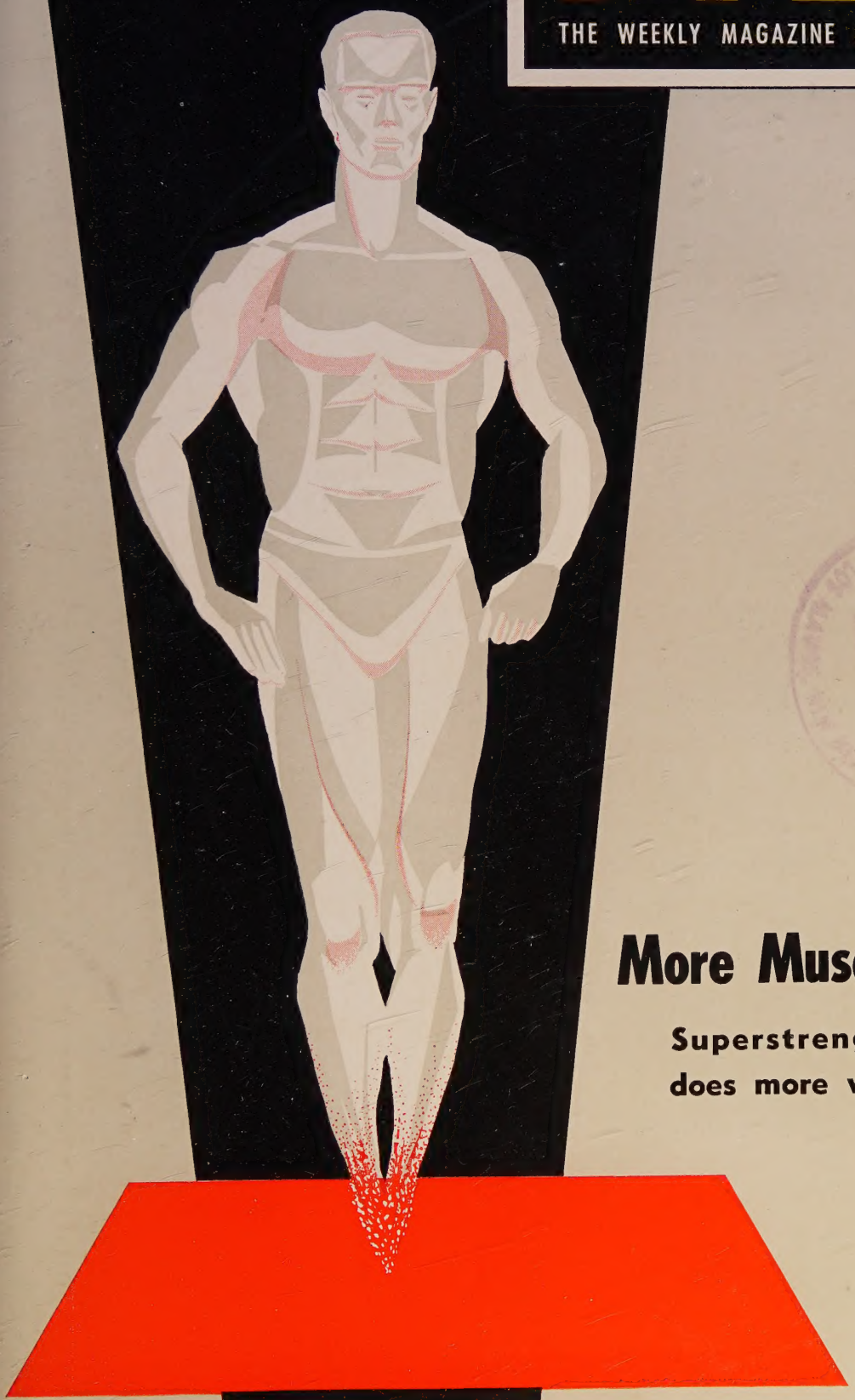
APRIL 25, 1955

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



More Muscles in Steel

Superstrength material does more work, page 96

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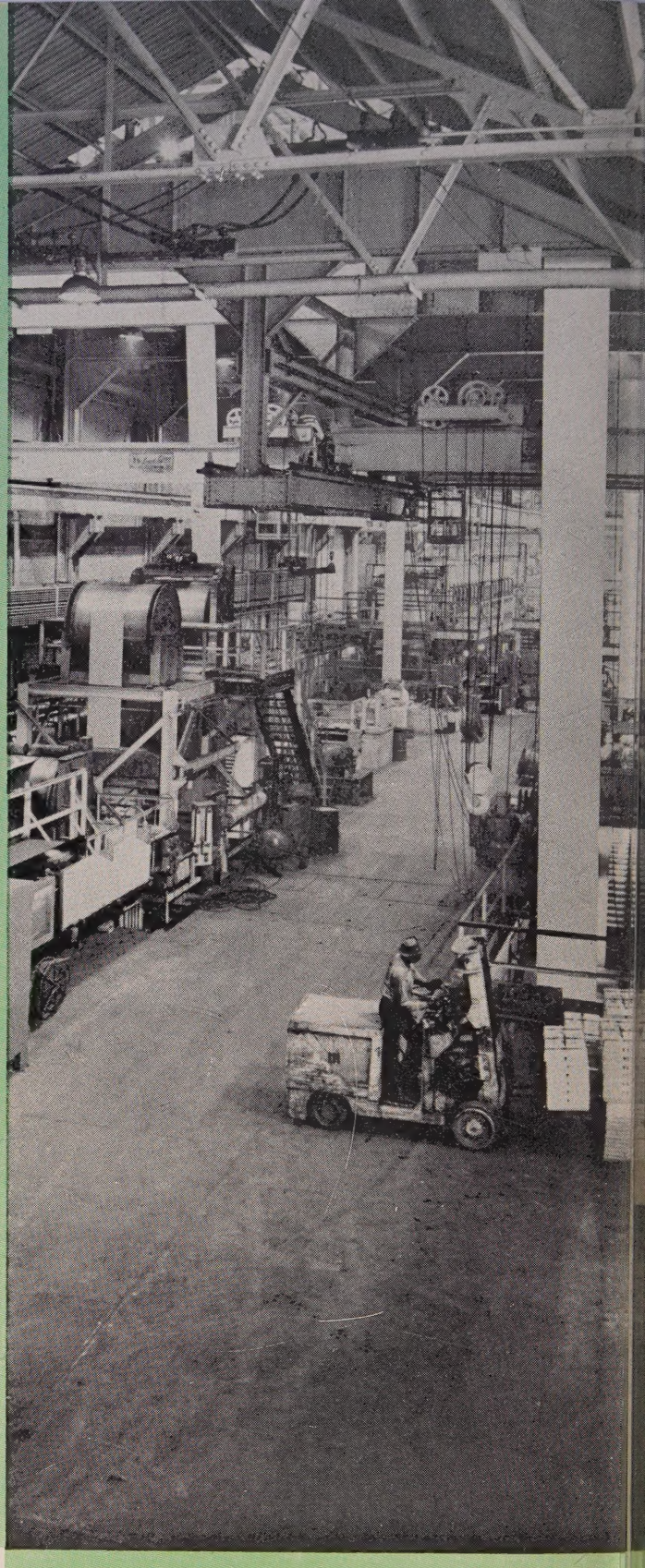
CONTINUOUS GALVANIZING LINES BUILT BY AETNA



● **The 25th Aetna-built Continuous Galvanizing Line** could be yours. If you are considering a Continuous Galvanizing Line, you probably have ideas about the most practical process for your production. The lines offered by Aetna-Standard include all of the different processes and types in use today. This ability to combine specialized knowledge of Continuous Galvanizing with your own specific ideas is a principal reason for Aetna's building more lines than all other manufacturers. Add the most important requirement of all—performance of the equipment, plus integrity and ability to work with people, and you have some of the reasons why more companies select Aetna-Standard than any other manufacturer to build their Continuous Galvanizing Lines.

Will the 25th be yours?

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

SUBSIDIARY and ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America

Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.

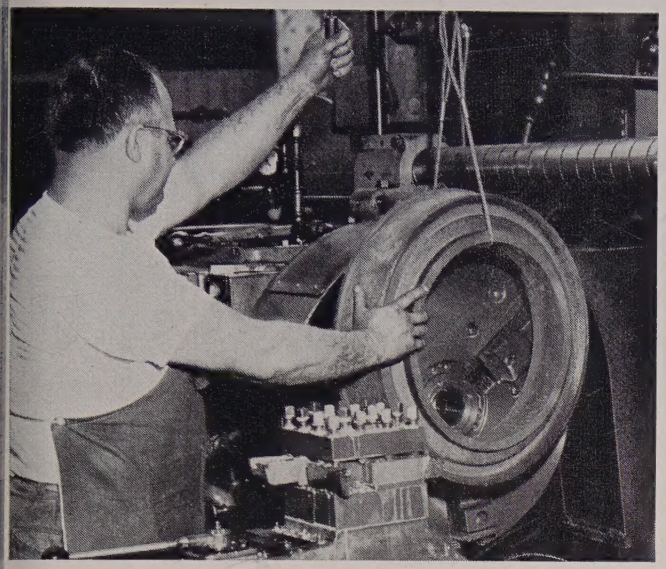
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.

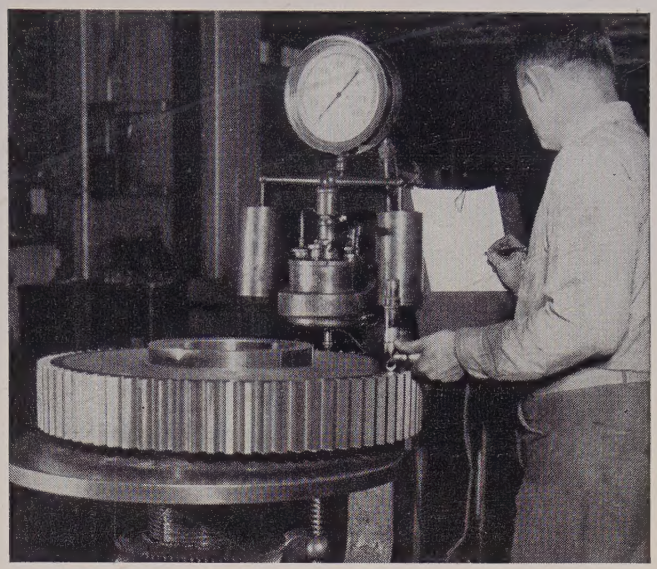
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.

Hale & Kullgren, Inc., Akron, Ohio — Representative for the Rubber Industry

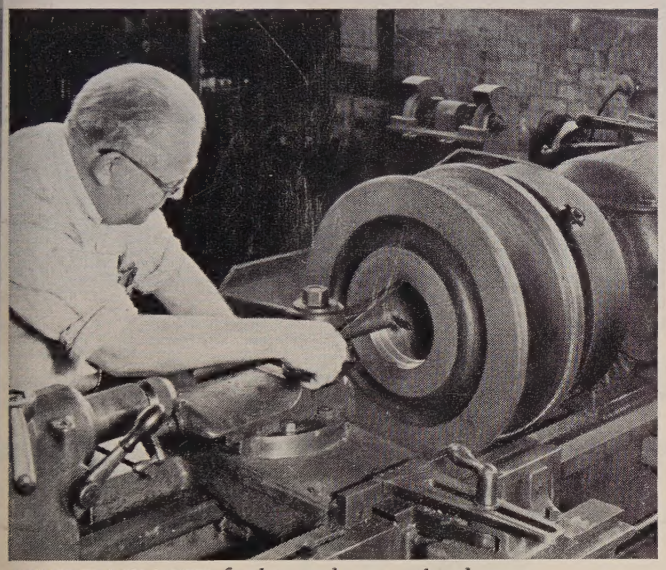
Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries



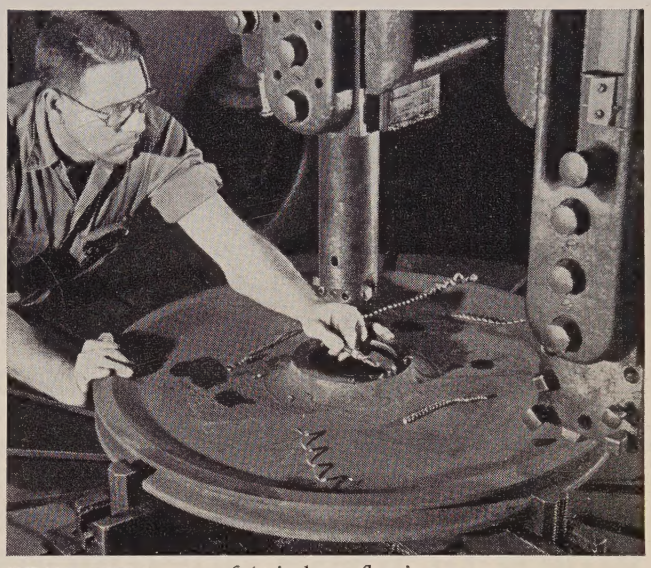
COMMUTATOR FORGING being positioned for machining.



SPUR GEAR for use in diesel locomotive service.



CRANE-TRACK WHEEL for heavy-duty overhead crane.



SHEAVE WHEEL—one of 43 in large floating crane.

So Many Different Uses for These Forged-and-Rolled Blanks

If you require circular steel blanks in the making of your products, Bethlehem has much to offer you, both in quality and variety. We manufacture forged-and-rolled blanks for a seemingly endless number of uses, and each year the list grows bigger.

Here are a few of the products being made today from these circular forgings: spur, bevel, and herringbone gears; double-flange crane-track wheels; industrial wheels of many kinds; turbine rotors and bucket wheels; clutch drums, brake drums; sheave wheels, flywheels; tire molds and mold rings. There are many additional applications, of course, some of them highly specialized.

Often the first problem in designing such products is to achieve high strength with a minimum of weight. Bethlehem's manufacturing process supplies an answer to this common problem. The blanks are processed in a unique mill that combines the steps of forging and rolling, so that the blanks have the density of forged metal plus the smooth grain flow of a rolled product. The end result is strength—strength so high that users often find it possible to employ thinner, lighter sections than they formerly specified.

Moreover, because of these same characteristics, the blanks machine more uniformly. Fewer machining cuts are required, and the cutting speed is frequently higher.

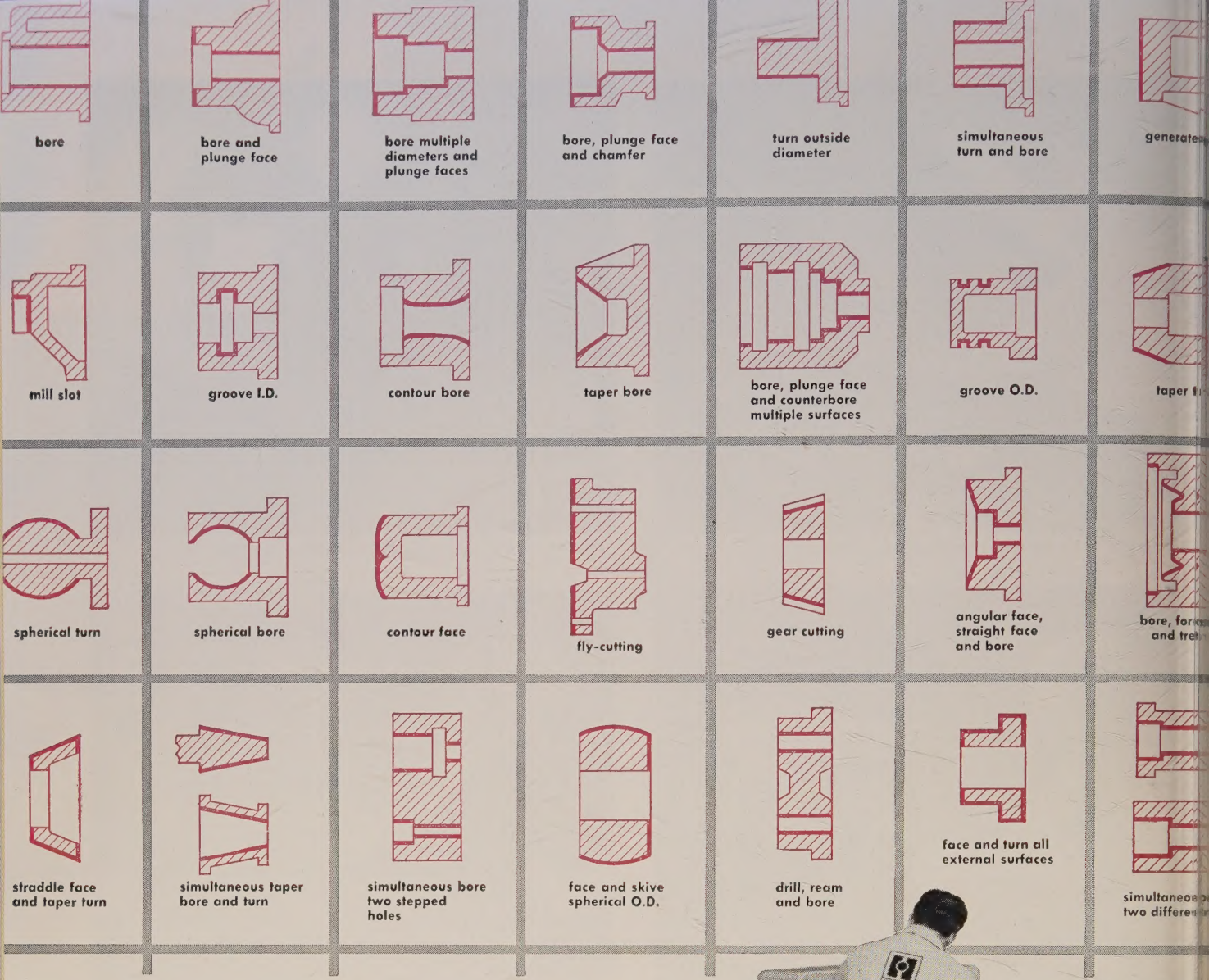
Bethlehem forged-and-rolled blanks are available in many different types, and in sizes from 10 to 42 in. OD. They can be furnished untreated or heat-treated, whichever you prefer. Write, phone, or wire our nearest office for complete information.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



which of these operations <u>can't</u> be done on a Heald Bore-Matic?

With one exception, all of the operations shown here, plus many more, are routine for a Heald Bore-Matic—a *single-end* Heald Bore-Matic using a *single setting*, as a matter of fact!

What's more, practically any of these operations can be *combined* in a single, high speed automatic cycle—finishing a variety of different surfaces, either simultaneously or in sequence, at a single setting. This fact makes a Heald one of the most *versatile* and *productive* precision finishing machines ever developed. As you have probably guessed by now, the one job shown that a Bore-Matic can't do to advantage is gear cutting.

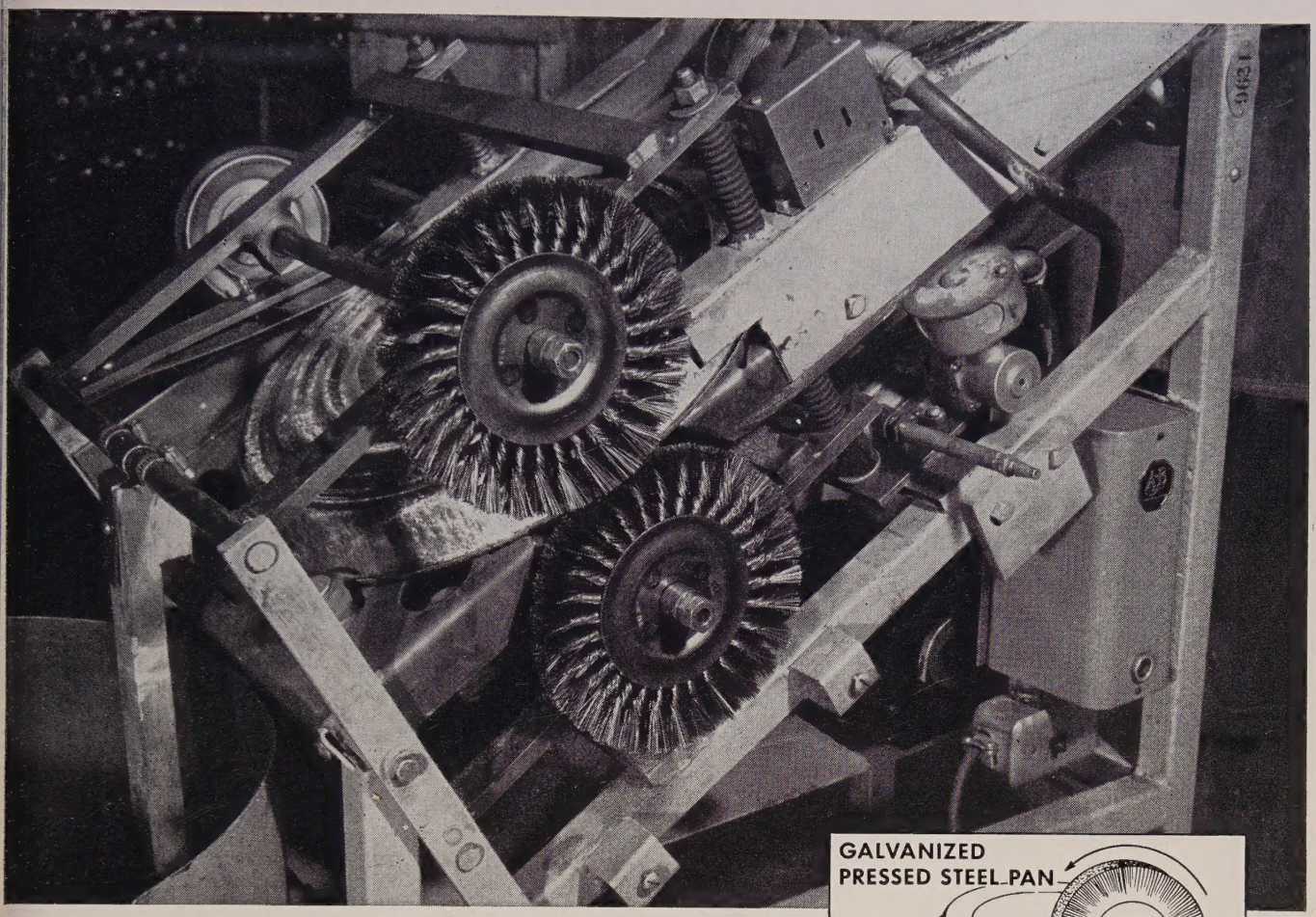
Whatever your borizing problem, you'll find that IT PAYS TO COME TO HEALD!

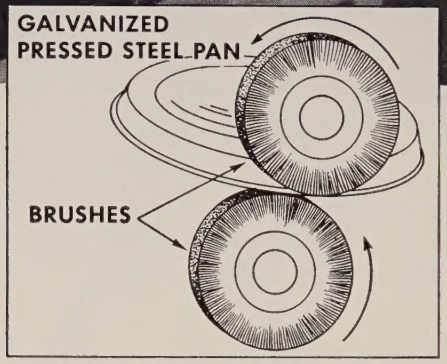
HEALD®

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York





10-second brush-off removes excess coating

Let an OBA help solve your production problems

A touch of ingenuity and Osborn Power Brushing. That's all it takes to remove hard drips of zinc from these galvanized steel pans.

After pans are dipped for galvanizing, the operator merely drops them in place on this machine. Two Osborn Disc-Center® Brushes spin the pans, brush the spelter from the edges. In 10 seconds—all the time it takes for brushing, pans are ejected automatically.

Does this idea suggest an answer to a problem you have? An **O**sborn **B**rushing **A**nalysis can show you where power brushing will help speed production, improve product quality. Call or write *The Osborn Manufacturing Company, Dept. G-31, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

ENGINEERING HELP. *When an Osborn Brushing Specialist makes an* **OBA** *in your plant, he'll study your cleaning, finishing and burr removal operations . . . show where you can cut costs, boost product quality.*

Osborn Brushes

OSBORN

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

FORGED TO GIVE CARS STRONG BODIES

● YOU CAN'T JUDGE A ROLL'S STRENGTH BY ITS FINISH.

In the Midvale roll above, both finish and strength are important . . . a hard surface for wear, a smooth surface to give a fine finish on auto body steel, and toughness for durability in cold rolling service.

Midvale forges rolls that have both. A half-century of steel-making experience goes into every roll . . . experience in casting ingots, in forging to develop its strength, in heat treating to give it desired properties where needed, and in machining to give it the surface finish.

Of major importance are the tests given the forging at different stages . . . tests to check on composition, structure, hardness, strength and dimensional accuracy.

The same is true of every Midvale product . . . rolls for steel or paper mills . . . forging and alloy castings for heavy machinery, reduction gears, hydraulic presses, turbine machinery, press cylinders and high pressure vessels.

You name the purpose . . . we'll supply the roll . . . of hardened and ground alloy or stainless steel.

THE MIDVALE COMPANY- Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 136 No. 17 April 25, 1955

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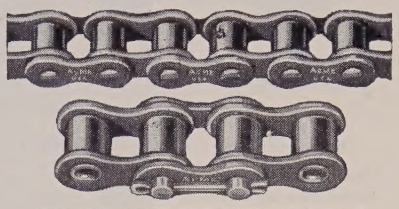
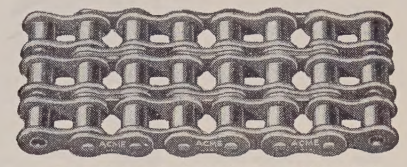
are custom made for
STRENGTH DURABILITY

COMPLETE PRODUCTION FACILITIES AND PROMPT DELIVERY ON ALL THESE CHAINS

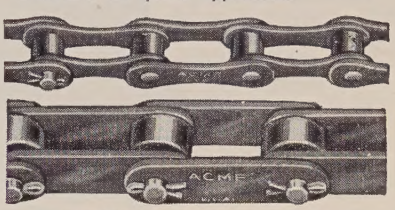
Plus engineering service when required



STANDARD ROLLER CHAINS
Available in pitches from ⅜" to 2½" riveted and detachable type.



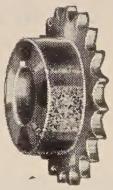
STANDARD MULTIPLE WIDTH
Multiple widths of six strand or wider available for special application.



DOUBLE PITCH CHAIN
For use in slower speed power transmission and material handling conveyors.

CABLE CHAINS
Acme Cable Chains are furnished in a variety of pitches, widths and strength.

SPROCKETS
Acme Sprockets are available in a wide range of sizes, in all types.



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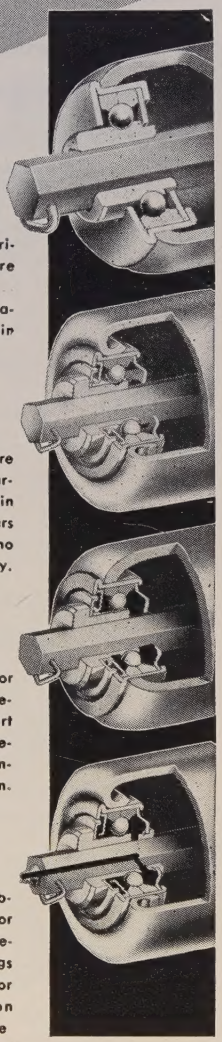
Write or Phone JEfferson 2-9458

Write Dept. 10-T for new illustrated 76 page catalog on use and application of roller chains and sprockets.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

Better Built

BUSCHMAN
roller
conveyors



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PLAIN BALL BEARINGS

Free-running non-lubricated bearings assure smooth roller rotation . . . ideal for most applications . . . do not retain foreign matter.

DUSTPROOF BEARINGS

True-labyrinth enclosure keeps dust out of bearings . . . rollers remain free-running after years of operation . . . no lubrication necessary.

GREASE-PACKED-FOR-LIFE BEARINGS

For heavy-duty or outdoor applications . . . true-labyrinth seal keeps dirt out and grease in . . . designed for years of maintenance-free operation.

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When rollers are subjected to severe heat or abrasive materials, true-labyrinth-sealed bearings with Alemite fitting for pressure re-lubrication assure maximum service

. . . TO MEET YOUR REQUIREMENTS

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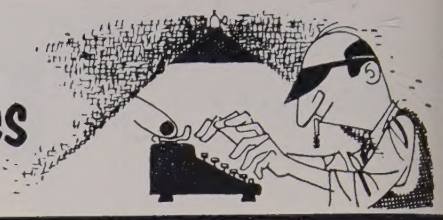
behind the scenes



Modern Alchemist

If good Dr. Gray, STEEL's technical editor, had the excellent fortune to have been born during the Middle Ages, and could have written a story similar to the one that begins on page 96 of this issue, what do you suppose would have happened to the Alchemist's Union? The boys would have tossed away their gaudy robes, clipped their shaggy beards, busted all their pots and given up their search for the philosopher's stone.

Those old alchemy boys were pretty tricky, but they were fumbling amateurs compared with the wizards Dr. Gray writes about: Men, who, through metallurgical processes, make steel do unheard of things; make it with properties never dreamed of.

What did the alchemists ever do? Well, there's a story about Raymond Lullius, a real hot shot in the racket. Raymond went to London in 1300 A.D. to visit Edward I, a royal character known as Longshanks. This Plantagenet boy was crazy about money, so Raymond fixed himself up solid by changing 50,000 lb of quicksilver into gold. Edward had it coined into rose-nobles (coins); and we're inclined to think there's something fishy about the whole deal.

There's nothing fishy about Dr. Gray's story on superstrength steels. It's nothing but facts, and right heady to management.

Backward Glances Ahead

Oh, young Robert Huber's come back from the West—
Through all the wide border he traveled with zest;
He stayed not for banquet, he stopped not for sport,
And on plants that he saw he will shortly report.

Widely traveled Machine Tool Editor Robert F. Huber last week drifted back into his office chair on the wings of a heat wave. Suitcases, brief cases and pockets bulged with notes and observations on metalworking in the West—particularly in the fields of machine tools, primary metals and aircraft. When pressed for comment, he absently shook some tumbleweed from the cuffs of his trousers and spoke in generalities.

"I visited the Kaiser offices in Oakland, Calif.; the Alcoa plant in Vancouver, Wash.; Bethlehem Pacific Coast Steel plant, Seattle; the Harvey Aluminum Co. in Los Angeles; and dozens of other organizations. Many activities out West are tied in with electronics, machine tools, instruments and gages. Many of them, in turn, are tied to aircraft, and aircraft is tied to government."

Bob's report on aircraft: "Incidentally, I saw that new plane at Convair: The Sea Dart. I saw it come up on the water, zip along on skis and fly, but I swear it's like the bumblebee: It just ain't designed to fly, but darned if it doesn't!"

Cutups With Cutouts

Ever since we resumed publication of our puzzles, we have been deluged by mail. First one in with the solution to the Case of the Faded Figures was a lady, gentlemen! Martha N. Stratton, Bureau of Business Research, Ohio State University, sent her answer air mail from Columbus, O. (Divisor, 625; dividend, 631938; quotient, 1011.1008.)

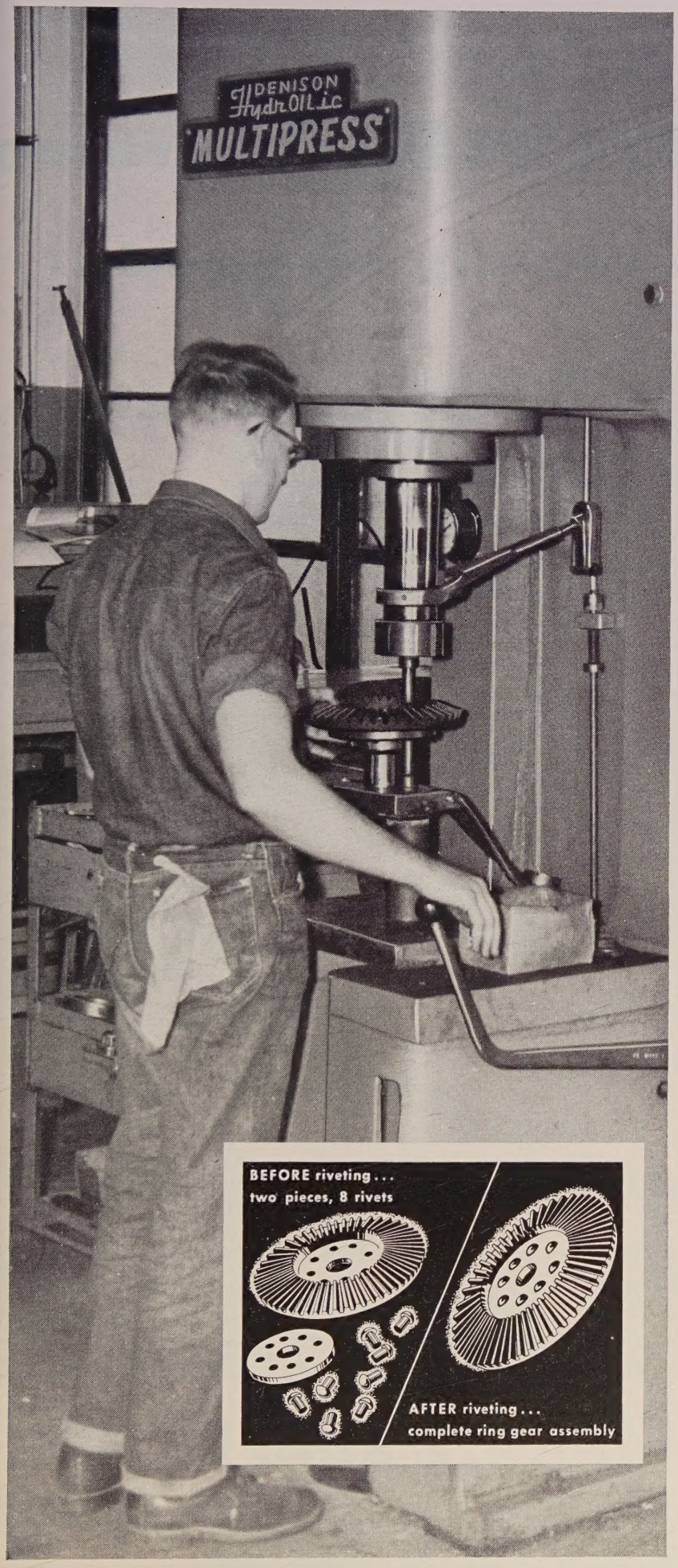
We hasten to add Max Bailey, Machine Products Corp., Montreal, Que.; D. J. Haack, H. H. Robertson Co., Ambridge, Pa.; K. S. Frazier, Detroit Steel Products Co.; C. G. Lohmann, Hart & Cooley Mfg. Co., Holland, Mich.; Austin R. Peterson, United Engineering & Foundry Co., Pittsburgh; and dozens of others got on the bandwagon.

Of course, there are other solutions which we don't mention.

Mr. Bailey wants harder problems. Well, here's a stinker: We have a box containing wooden cutouts of letters. There are 8 Gs, 9 Ms and 30 each of A, N, R. Now, how many ways are there to pick out and arrange these letters to make the word ANAGRAM?

Shrdlu

(Metalworking Outlook—Page 47)



One man, one **DENISON MULTIPRESS®** ... 9 times the production per man

At Barber-Greene Company, they've tripled production for riveting together two halves of a ring gear assembly.

With former hot rivet method, the best a three-man team could do was 10 assemblies an hour. The operation was slow, noisy. Distortion from heat made a boring operation necessary.

With cold riveting, using Denison's hydraulic Multipress, flow of metal is better, more uniform. There's no heat, no warpage. One operator rivets 30 assemblies an hour.

You can get the same results. Send for bulletins and case studies on applications in the one to 75-ton pressure range. Write to:

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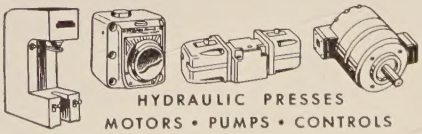

HYDRAULIC PRESSES
MOTORS • PUMPS • CONTROLS

die blocks accurately

economically shaped...

on a CINCINNATI SHAPER

at the **DROP DIES AND FORGINGS CO.,** Cleveland, Ohio

Accuracy and convenience make money for this customer. This accurate Cincinnati Shaper and the convenient special die block vise are factors in this economy.

Some more Cincinnati money making features:

- Smooth operating Magnetic-clutch and Brake.
- Automatic high pressure oiling (50 P.S.I.).
- Multiple cam feed.
- Extended ram bearings.
- Solid ram ways integral with column.
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Write for Shaper Catalog N-6.

Photo courtesy Drop Dies and Forging Company, Cleveland, Ohio.

CINCINNATI

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CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

and

Forming the above Special Phillips Truss Head in two blows presented a difficult upsetting task. This was successfully accomplished when the manufacturer specified Keystone "Special Processed" Cold Heading Wire.

The uniform grain flow properties of "Special Processed" Wire provided the desired upsetting and die forming qualities necessary to form the thin head section without distortion or cracking. The structural soundness and uniformity of "Special Processed" Wire further proved itself by trouble-free machine operation, longer die life and a finished product of the highest quality.

Next time you have a difficult cold heading job, try "Special Processed" Wire. See your Keystone representative or write for more information.

Keystone Steel & Wire Company
Peoria 7, Illinois
Industrial Wire Specialists

LETTERS
TO THE EDITORS

Useful Information

Please send me a copy of parts I and II of the Vacuum Heat Treating series (Apr. 11, page 108 and Apr. 18, page 108). As a design engineer, I find this information useful.

Al Pfizenmaier
Atomic Energy Division
Sylvania Electric Products Inc.
Bayside, N. Y.

Will you please send me three copies.

R. L. Sweet
professor
School of Engineering
Michigan State College
East Lansing, Mich.

• *Sent.—ED.*

Titanium Fire Probers

We would appreciate 12 tear sheets of your article, "How To Handle Titanium" (Mar. 21, page 134). The information is of interest and value to us.

We have done preliminary laboratory work and field tests on titanium fire extinguishing, but we cannot make definite claims of success. Experiments also are being conducted on other metal fires. Our new M-X extinguisher does put out magnesium chip fires, not merely covering or controlling them.

T. G. Metz
assistant vice president
Buffalo Fire Appliance Corp.
Dayton 4, O.

• *Sent.—ED.*

Metal Distribution

In STEEL, you give data covering nation-wide consumption of steels, aluminum and brass. Have you published data covering state-wide or regional areas, such as the New England and Middle Atlantic states? If not, can you tell us where such data are obtainable?

Bert W. Whitehurst
registered professional engineer
Niles Bldg.
Boston

• *For geographical distribution of metals, we suggest you obtain the report issued by the U. S. Bureau of the Census, called* Facts for Industry, series NPAF-1-02. *Released Nov. 1, 1954, it covers 1951 and 1952.—ED.*

Repair with Plastic

Can you tell me who makes or sells the plastic repair kit mentioned in the "Mirrors of Motordom" column (Mar. 28, page 51)?

Charles Eder
chief inspector
General Motors of Canada Ltd.
Oshawa, Ont.

• *We suggest you write Mr. Robert Ross, Campbell-Ewald Co., General Motors Bldg., Detroit 2, Mich. This is our source of information.—ED.*

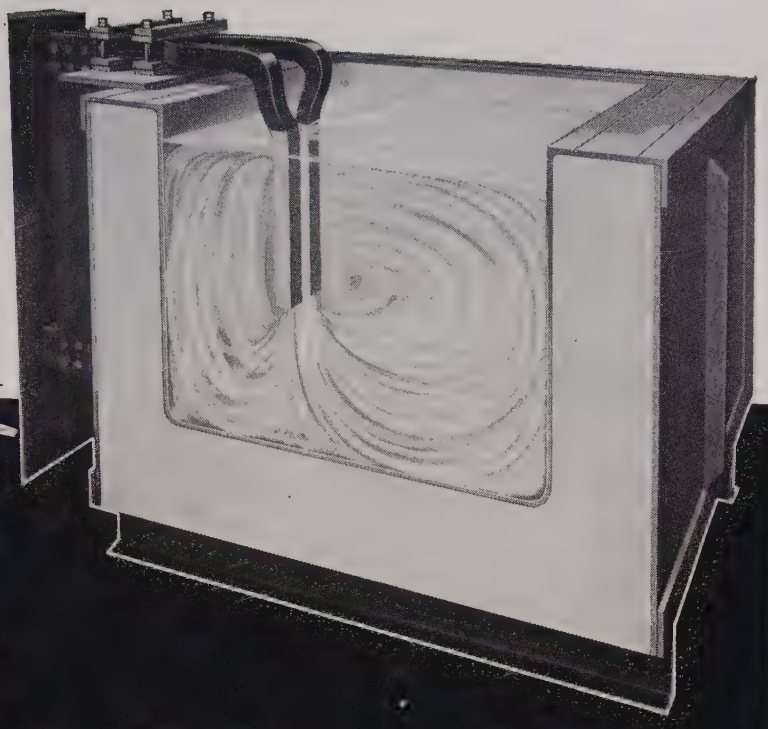
Words from Readers

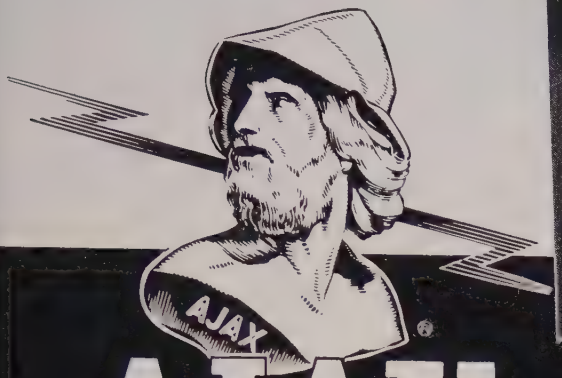
I notice that you quote Mr. Pendray's comments on air pollution problems in your article, "Smog Losses: $1.5 Billion Yearly" (Mar. 21, page 76).

We recently conducted two surveys on

(Please turn to page 12)

Suspended-electrode type furnace

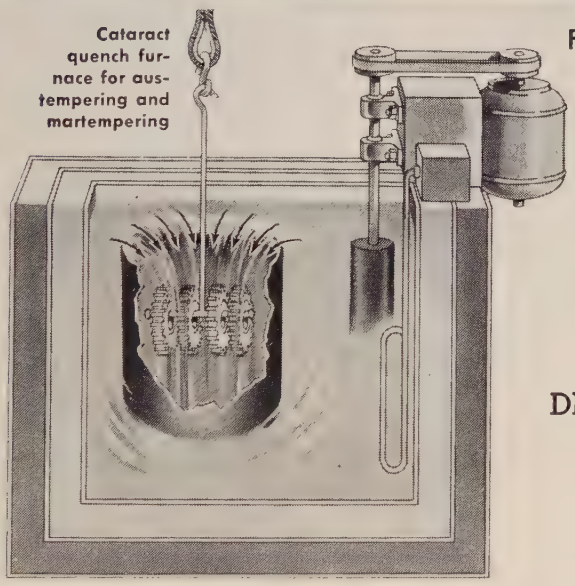




AJAX
HULTGREN

Salt Bath Furnaces

Cataract quench furnace for austempering and martempering



For any of these applications . . .

ALUMINIZING
ANNEALING
AUSTEMPERING
BRAZING
CARBURIZING
CLEANING
CYANIDE HARDENING
CYCLIC ANNEALING
DESCALING . . . DESANDING
DRAWING
HARDENING
HEATING FOR
FORGING AND FORMING
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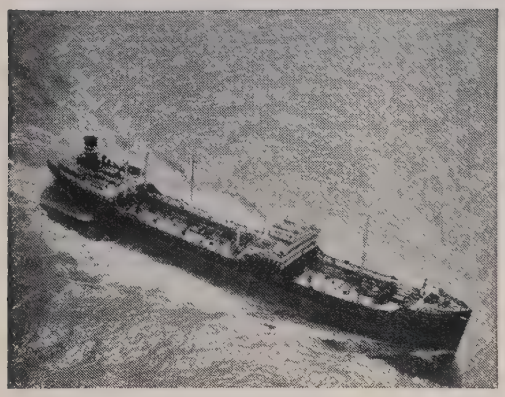

with Federated magnesium anodes. When designed and installed correctly, the low-cost anodes corrode and the high-cost ship does not. Saves thousands of tons of steel annually. Federated Metals has a Corrosion Advisory Service which works to help the marine, petroleum, natural gas and other industries. Literature available.

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Federated first in the non-ferrous field — FMD

LETTERS

(Concluded from page 10)

air pollution problems: "Management Policy and Air Pollution" and "Odors and Fumes as Air Pollution Problems." If your readers wish copies, they may write us.

John Hoving
Pendray & Co
55 W. 42nd St.
New York 36

. . . STEEL is read by eight to ten of our people every week. We look forward to its arrival.

Robert R. Hendren
general sales manager
Richard C. Remmey Son Co.
Philadelphia

• *Thank you.—ED.*

Let There Be Light

I enjoyed your coverage of McLouth and Dominion in the article, "Oxygen Steelmaking Arrives" (Apr. 4, page 80). I believe it will be well received. As a point of information, why were Kaiser Engineers not mentioned?

Naturally, as you can understand, I have been gently chided about the absence of a reference. Will appreciate any light you can throw on the subject.

R. A. Bateman
manager, public relations
Kaiser Engineers
Oakland, Calif.

• *Kaiser Engineers are the licensors for the Austrian process (of oxygen steelmaking) for North America (except Canada). The story mentioned none of the equipment suppliers or licensors.—ED.*

Causes of Cracking

Your Technical Outlook department (Mar. 28, page 77) reports a direct relationship between hot cracking, low hot ductility and sulphur content of steel. Can you refer us to the article in which this is discussed?

James J. Curran
chief metallurgist
Walworth Co
Greensburg, Pa

• *This information is in two Office of Technical Services reports:* Causes of Cracking in High-Strength Weld Metals, Part I *(PB111531) and* Part II *(PB111532). Order them from OTS, U. S. Department of Commerce, Washington 25, D. C.—ED.*

Analysis Requested

We would appreciate six copies of the 30th Annual Financial Analysis of the Steel Industry (insert in the Apr. 11 issue of STEEL).

Otis Brubaker
director, research department
United Steelworkers of America
Pittsburgh

• *Sent.—ED.*

Suppliers Wanted

You mention use of epoxy resins in your "Mirrors of Motordom" column (Mar. 28, page 51). Who can supply this material?

Richard H. Grosse
Engineering Department
Trackson Co.
Milwaukee

• *There are many excellent suppliers. One is Kish Industries Inc., 1301 Turner St., Lansing, Mich.—ED.*

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you just finish the job sooner

and at lower cost per piece

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you *finish them faster* because non-cutting (idle) time is accelerated and controlled. The complete machining cycle is entirely automatic and predetermined—to give the minimum time per piece, on *every piece*. Machining is done at the surface speed best suited for required finish and tolerance because each toolslide is independently cammed and selective spindle speeds are automatically controlled.

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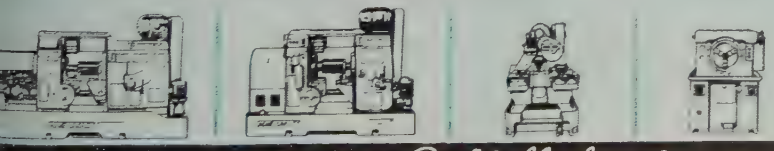

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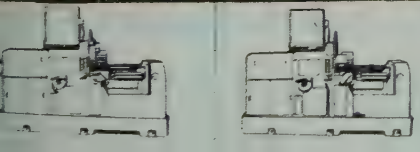

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1. Steel Sheet, smeared with die lubricant, is fed into the jaws of a powerful press that will deep draw it to the contour of a refrigerator door.

2. Smooth Finish is provided by grinding and polishing the door panel until the steel surface is bright and flawless.

Where Steel Goes Home-Hunting

Have you ever watched a woman select a refrigerator? She'll stand off and admire it, consider its capacity and color, check the conveniences it offers, examine its finish and compare it with others for styling and price. She wants the best looking, handiest, and most solidly constructed model she can fit into her kitchen and budget.

To give her what she wants takes better than ordinary steel. In today's competition, appliance manufacturers are insisting more than ever before on higher quality cold rolled steel sheets to meet high-speed production line requirements for producing the best looking appliances at lowest cost.

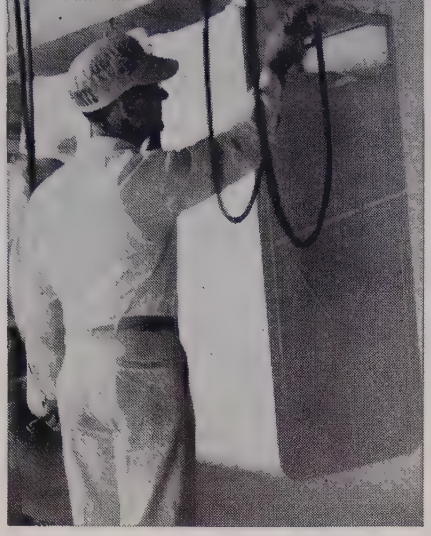
Many sheet steel users are specifying sheet steel from Pittsburgh Steel Company, where new equipment and the latest developments in electronic control are coupled with a half-century of know-how to produce exactly what is needed to meet these high-speed production line requirements.

• **What It Takes**—If you wonder why the quality of steel is so important, consider the appliance maker's problems for a moment.

The door panel for a refrigerator, for example, arrives at his plant as steel sheet. Fed into an 800-ton two-stroke ram press on one of his press lines, the sheet is deep drawn. Actu-

(Advertisement)

3. Steel Cabinets to encase the refrigerator are assembled and finished with careful precision for show-room appeal.



4. Glistening Coats of durable finishes in many colors are applied to the steel so that it will blend in with the dream kitchen.

ally the steel flows under tremendous pressure to make the strong, smoothly contoured door panel.

Each sheet must flow evenly to provide a complete door that has no surface imperfections such as grainy areas, seams, buckles, wrinkles, stretcher strains, or skin breaks and as this press can make eight door panels a minute, the steel must be absolutely uniform from sheet to sheet.

To provide uniformity, the steel's chemical composition cannot vary more than a few hundredths of one per cent. It must be clean and its grain structure must be controlled with microscopic accuracy. The finished cold rolled sheet cannot vary more than a few thousandths of an inch in thickness and must meet other close dimensional tolerances.

Whether it's a door panel, an outer cabinet, a compressor shell, or any of more than a dozen special steel parts in a refrigerator, the story is always the same. The steel must have special inherent qualities to meet specific production line requirements and then go home-hunting.

• **How It Pays**—From modernized blast furnaces through to the newest sheet mills in the industry at Pittsburgh Steel, the making of steel is geared to meet the manufacturers' precise needs with the best that long experience and modern technology can produce.

If you use hot or cold rolled sheet steel in your operations, why not take advantage of the opportunities Pittsburgh can offer you in increased yield, longer die life, faster production, and better quality products. A phone call today to the office nearest you will bring prompt personal service.

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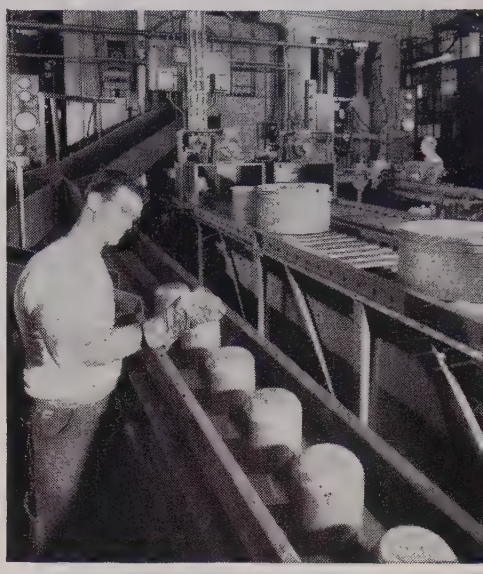
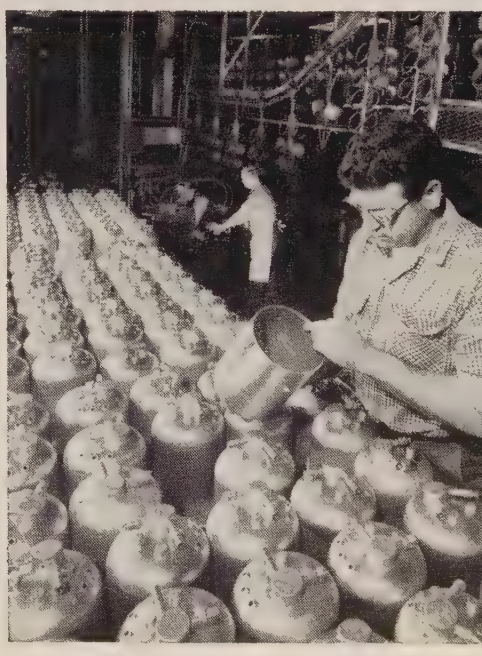
Write for your copy of the color brochure "The New Pittsburgh Steel Company."

Steel gets a two-way stretch



In forming the compressor shell for a refrigerator, disks of steel, 13⅜ inches in diameter, are blanked from hot rolled drawing quality sheet (right). The blank feeds into a 200-ton double acting press (in background) where the first stroke draws it into a cup 3½ inches deep. The next stroke turns the cup inside out, drawing it to a finished depth of 6½ inches with a diameter of 6⅞ inches.



After forming, the shell is trimmed, pierced and has fittings brazed into it. All parts must fit snugly, containing pressure without gaskets, to provide the heart-beat of the refrigerator as refrigerant is circulated. This ultra-modern, automatic equipment can produce up to 7,000 compressor shells daily.

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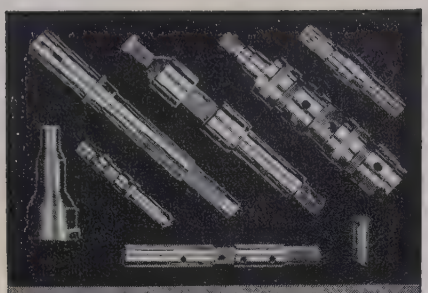

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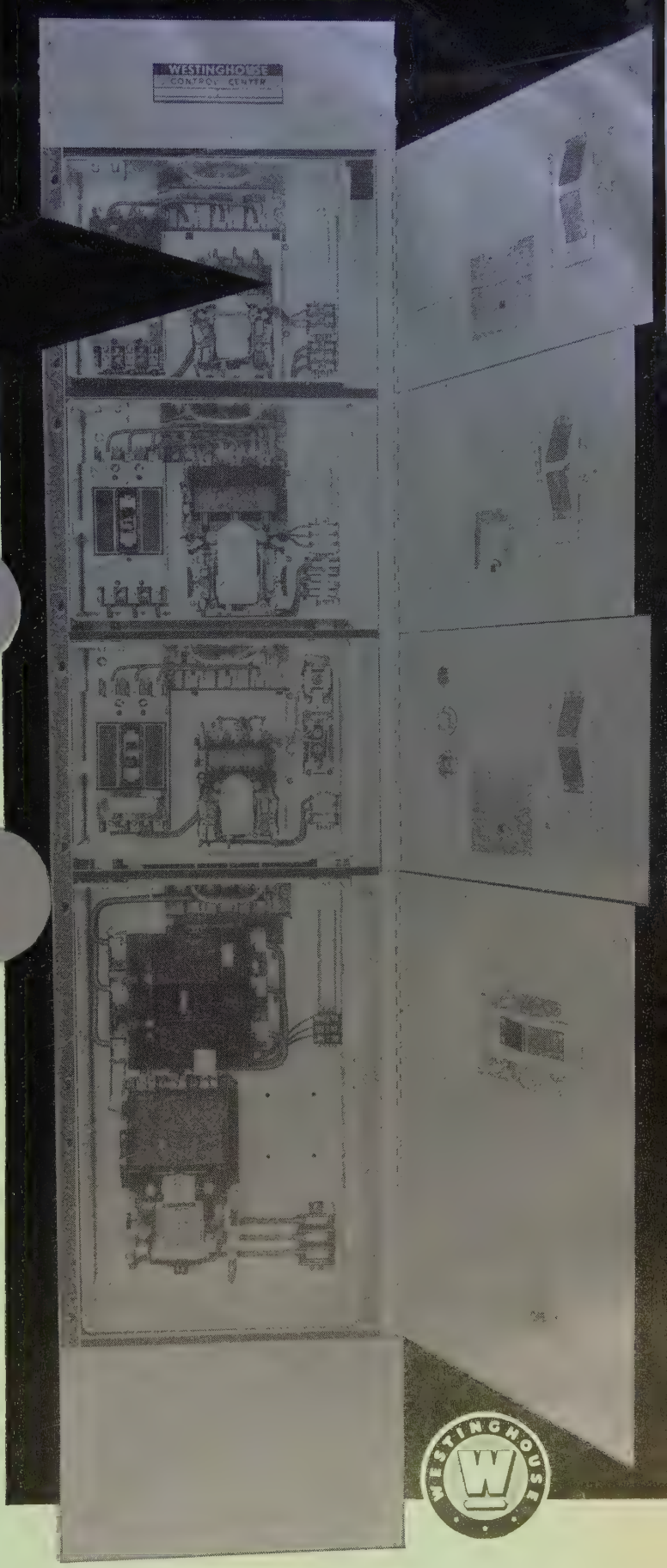

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...this handbook "ALUMINUM FORMING" gives complete information on aluminum techniques

Everyone who works with aluminum should hav this 148 page handbook from the Reynolds librar of technical handbooks. "Aluminum Forming" wa published so that product designers and plant super visors could have, in a single volume, complete infor mation on the proper techniques for bending, form ing and drawing aluminum. Design and fabricatin practices with aluminum are not always exactly lik those for other metals. In some cases modification or even special procedures may be required. Thi handbook fully explains all these procedures and in cludes more than two hundred and thirty drawing and photographs, twenty-two tables and thirty-tw formulas.

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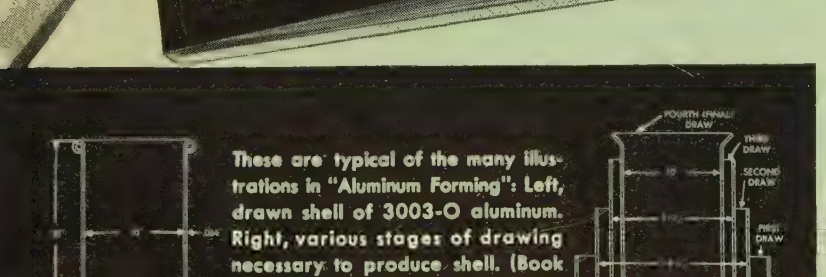


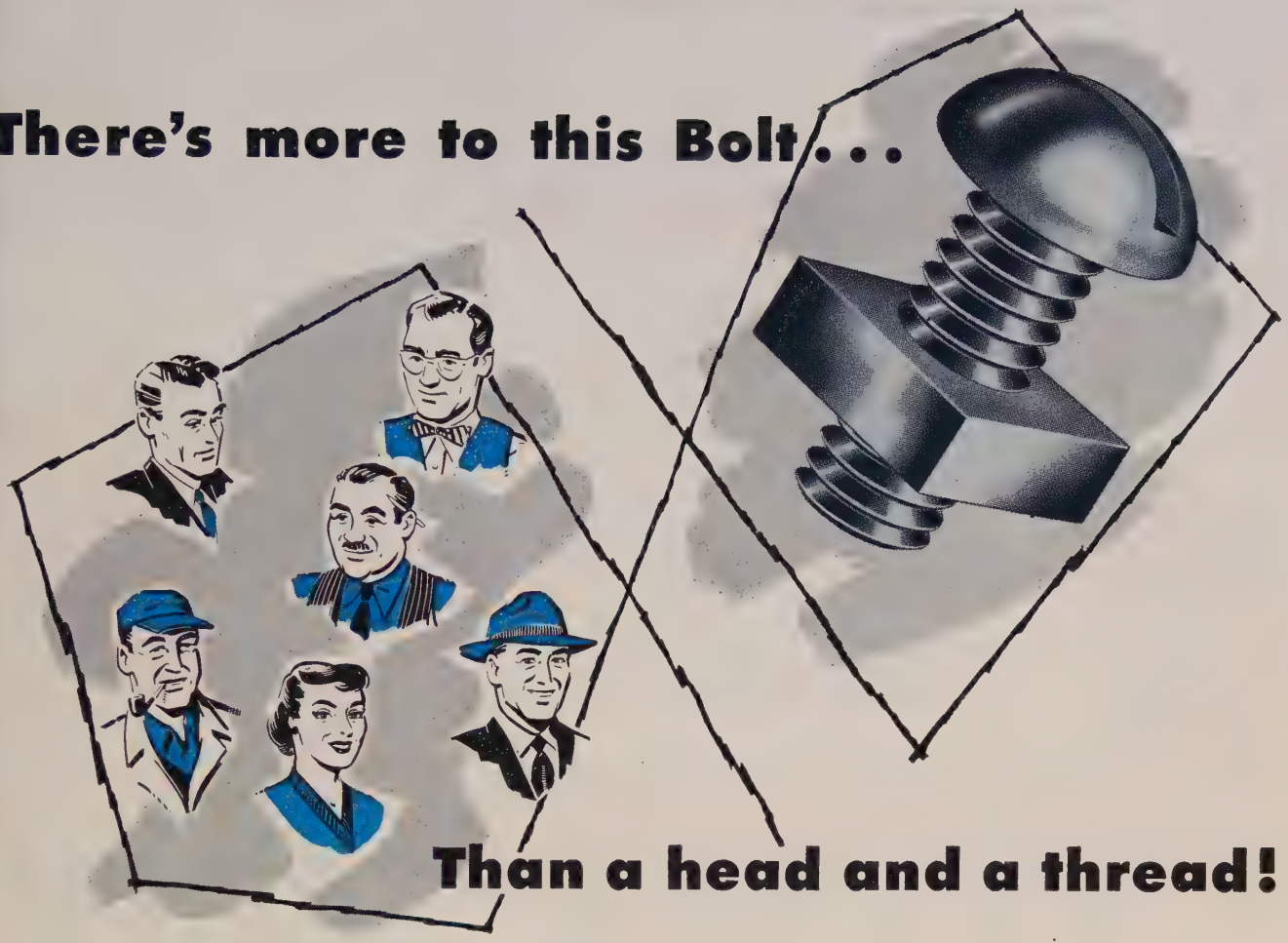
These are typical of the many illustrations in "Aluminum Forming": Left, drawn shell of 3003-O aluminum. Right, various stages of drawing necessary to produce shell. (Book includes formula for estimating number of draws.)

See "Mister Peepers", starring Wally Cox, Sunday nights on NBC-TV

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

There's more to this Bolt...



Than a head and a thread!

Yes, there are many more things than meet the eye, even behind the most common type of bolt.

Such things as the *people* who engineer, manufacture, package, sell and ship these bolts.

Such things as the *pride* they take in turning out products that have a little extra something.

Such things as *skill* and *craftsmanship*, that are unseen but still noticed in the finished product.

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SQUARE AND HEX MACHINE SCREW NUTS
Also semi-finished, hot pressed and cold punched nuts.

LOCK NUTS
Economical, vibration proof. Can be used repeatedly.

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Steel, brass, aluminum and stainless steel.

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Cup point type, hardened and heat-treated.

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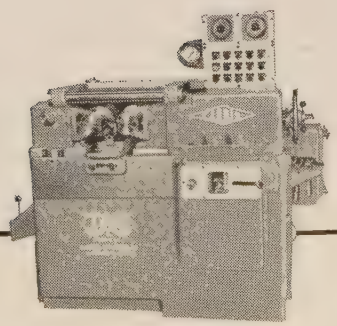

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Plan today to investigate the cost-saving advantages of the new LAN-HY-ROL Thread Rolling Machine. Contact us direct in Waynesboro, or through one of our field representatives, about arranging a demonstration.

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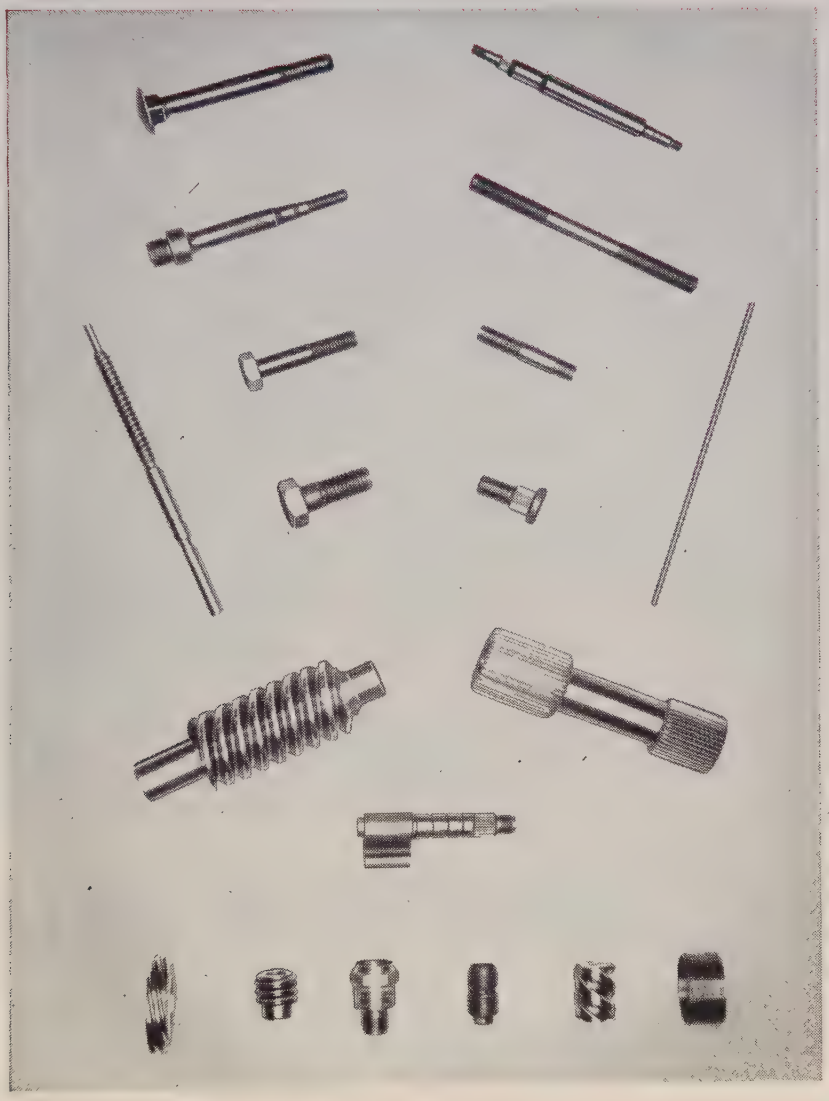

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One man's problem may call for alloy steel . . . another's a stainless steel . . . and a third's a special carbon steel . . . all made by Republic. At Republic, we roll more types of steels and make more types of steel products than any other producer. From decades of experience with many problems and many fabrication processes, the Republic Technical Man can hand you the answer that meets your needs.

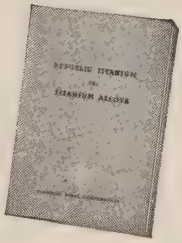
Whether your product must move lightly, stand still, look beautiful, or fight corrosion . . . the Republic Technical Man and his background of experience are prepared to serve you.

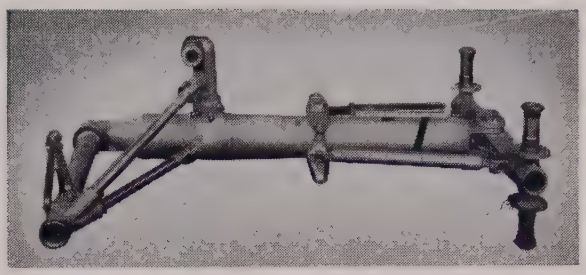
The coupon below will bring you information about Republic Titanium, Republic Stainless Steels, and Republic Alloy Steels.

REPUBLIC STEEL

World's Widest Range
of Standard Steels and Steel Products

LATEST FACTS ABOUT REPUBLIC TITANIUM





WHAM! EVER THINK OF THE TREMENDOUS STRAIN on the landing gear when the huge aircraft you are in hits the runway at high speed? Don't worry, the landing gear can take it. Republic Alloy Steels provide the high strength and toughness needed to withstand high impact and heavy loads in aircraft landing gear—provide the hardenability to resist wear on bearing surfaces.

REPUBLIC HIGH STRENGTH STRUCTURAL BOLTS provide a new, fast, economical way to fasten structures permanently. Bolting reduces noise. Replaces field riveting. Is often safer and easier than other methods. Work usually is done from within structure, eliminating costly scaffolding. Made in accordance with ASTM Spec. A325. Bolts marked for easy identification to conform to Spec. for Assembly of Structural Joints, 2-27-54, Research Council on Riveted and Bolted Construction.

SAVE UP TO 25% IN WEIGHT, EVEN 50% with Republic High Strength Steel. Yes, when you engineer earth moving equipment, truck and gasoline trailers, railroad cars, and other mobile equipment to take full advantage of the high strength, low weight and corrosion-resistance of Republic High Strength Steel, you can cut weight up to 50%. And you can lengthen equipment life, too.

REPUBLIC STEEL CORPORATION
3120 East 45th Street
Cleveland 27, Ohio

REPUBLIC STEEL

Please send me more information on:

☐ Titanium ☐ High Strength Bolts
☐ High Strength Steel ☐ Alloy Steels

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

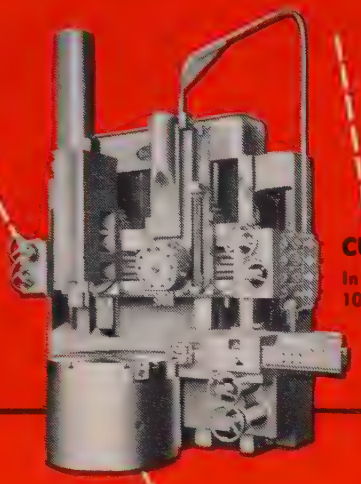
K-8287

BULLARD

offers You Tomorrow's Machine Tools . . . Today

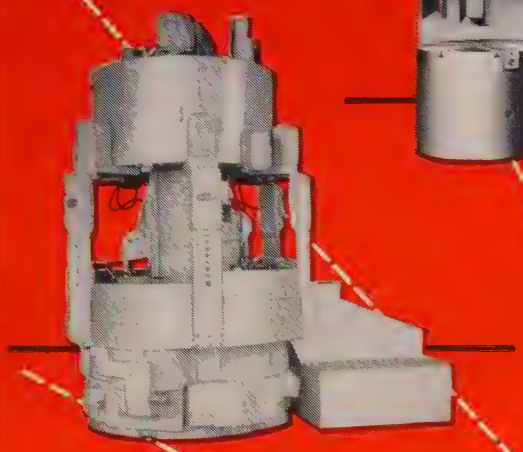
New products, methods, materials and cutting tools have out-dated many machine tools still in use. If your plant is operating under this handicap, it is important that you investigate the completely new line of Bullard Machine Tools.

Just call your nearest Bullard Sales Office or Distributor or write The Bullard Company, Bridgeport 2, Connecticut. Telephone EDison 6-2511.

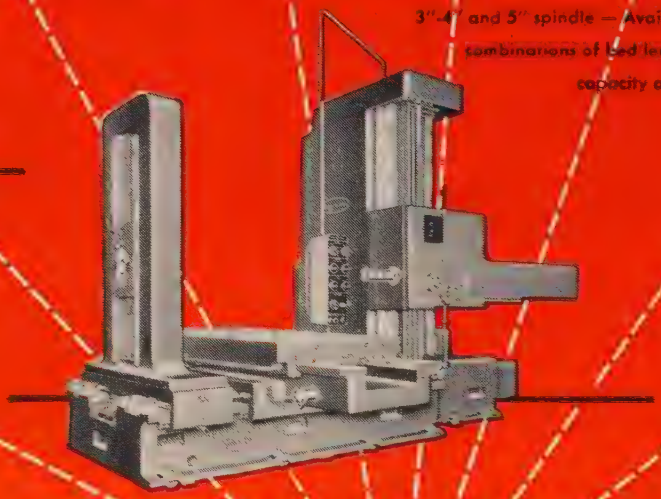


MULT-AU-MATIC
Type "L"
10" with 6, 8, 12 or 16 spindles, 14" and 18" with 6 or 8 spindles

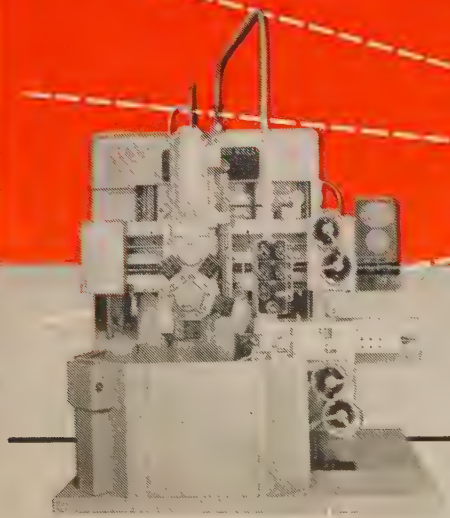
CUT MASTER V.T.L. Model 75
In six sizes, 26" to 76" table diameters in 10" increments. Various combinations of heads are available



HORIZONTAL BORING, MILLING AND DRILLING MACHINE Model 75
3"-4" and 5" spindle — Available in many combinations of bed lengths, vertical capacity and table size.



MAN-AU-TROL Model 75
For fully automatic operation — may be applied to any or all heads of Cut-Master V.T.L. Model 75 at time of ordering or in your plant at a later date



SEVENTY FIFTH
1888 BULLARD 1963
ANNIVERSARY

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

CALENDAR
OF MEETINGS

Apr. 25-27, Association of Iron & Steel Engineers: Annual spring conference, Hotel Statler, Detroit. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Apr. 27-29, Grinding Wheel Institute and Abrasive Grain Association: Spring meeting, the Homestead, Hot Springs, Va. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15, O.

Apr. 27-29, Society for Experimental Stress Analysis: Spring meeting, Hotel Statler, Los Angeles. Society's address: P.O. Box 168, Cambridge 39, Mass. Secretary-treasurer: W. M. Murray.

Apr. 27-29, Rail Steel Bar Association: Annual meeting, Grand hotel, Point Clear, Ala. Association's address: 38 S. Dearborn St., Chicago 3, Ill. Secretary: W. H. Jacobs.

Apr. 28-29, American Zinc Institute Inc.: Annual meeting, Drake hotel, Chicago. Institute's address: 60 E. 42nd St., New York 17, N. Y. Executive vice president-secretary: Ernest V. Gent.

Apr. 28-30, Lead Industries Association: Annual meeting, Drake hotel, Chicago. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

May 1-4, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Conrad Hilton hotel, Chicago. Association's address: 11 S. LaSalle St., Chicago 3, Ill. Secretary: Arthur C. Kreutzer.

May 1-4, National Metal Trades Association: Western plant management conference, French Lick Springs hotel, French Lick, Ind. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: Charles L. Blatchford.

May 1-5, Electrochemical Society Inc.: Spring meeting, Sheraton-Gibson hotel, Cincinnati. Society's address: 216 W. 102nd St., New York 25, N. Y. Secretary: Dr. Henry B. Linford.

May 4-6, American Management Association: Insurance conference, Hotel Statler, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

May 4-6, International Aviation Trade Show: 69th Regiment Armory, New York. Information: Aircraft Trade Shows Inc., Hotel McAlpin, New York 1, N. Y.

May 4-7, National Screw Machine Products Association: Annual meeting, Hotel Statler, Buffalo. Association's address: 2860 E. 130th St., Cleveland 20, O. Executive secretary: Orrin B. Werntz.

May 5-6, Investment Casting Institute: Spring meeting, Park Sheraton hotel, New York. Institute's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: Harry P. Dolan.

May 7-15, Society of the Plastics Industry Inc.: Annual meeting and conference, cruise on *Queen of Bermuda*. Society's address: 67 W. 44th St., New York 36, N. Y. Executive vice president: William T. Cruse.

May 8-11, Automotive Engine Rebuilders Association: Annual meeting, Cleveland hotel, Cleveland. Association's address: 419 N. Capitol Ave., Indianapolis 4, Ind. Executive vice president: R. G. Patterson.

May 8-11, National Industrial Advertisers Association: Annual meeting, Sheraton Park hotel, Washington. Association's address: 1776 Broadway, New York 19, N. Y. Executive secretary: Blaine G. Wiley.

May 9-11, Metal Treating Institute: Spring meeting, Ambassador hotel, Los Angeles. Institute's address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

May 10-12, Metal Powder Association: Annual meeting and exhibit, Bellevue-Stratford hotel, Philadelphia. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

STOP
CORROSION
BEFORE
it starts
ESCO 0.03 MAX. CARBON STAINLESS CASTINGS
STOP CORROSION...EVEN AT THE WELD
Most castings must be welded to component parts during installation. This usually means "carbide precipitation" and resultant corrosion along the weld, unless unit is heat treated—an always difficult, sometimes impossible job.
ESCO 0.03 Max. carbon castings can be welded into working position without loss of corrosion resistance—even at the weld. Result: Dependable corrosion-resistant operation. A definite cut in operating costs.
ESCO will produce to your specifications one casting or an entire installation. Spuncast®, Shellcast and conventional casting facilities are available. Write for details.
THE TOUGHEST CORROSION PROBLEMS WIND UP AT...
ESCO
HIGH ALLOY DIVISION
ELECTRIC STEEL FOUNDRY CO.
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2160 N. W. 25th Ave.
Portland 10, Oregon
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Danville, Illinois
ESCO International — New York Office
at 420 Lexington Ave., New York City, or
Portland Manufacturing Plant
Other Offices and Warehouses
Los Angeles
San Francisco, Calif.
Seattle, Spokane, Wash.
Houston, Texas
Eugene, Oregon
Salt Lake City, Utah
Honolulu, Hawaii
In Canada, Vancouver British Columbia and Toronto, Ontario

Eagle Music Wire

—for Dependable Springs—

has been famous for its
UNIFORM QUALITY and
PRECISION STANDARDS
for more than fifty years

106

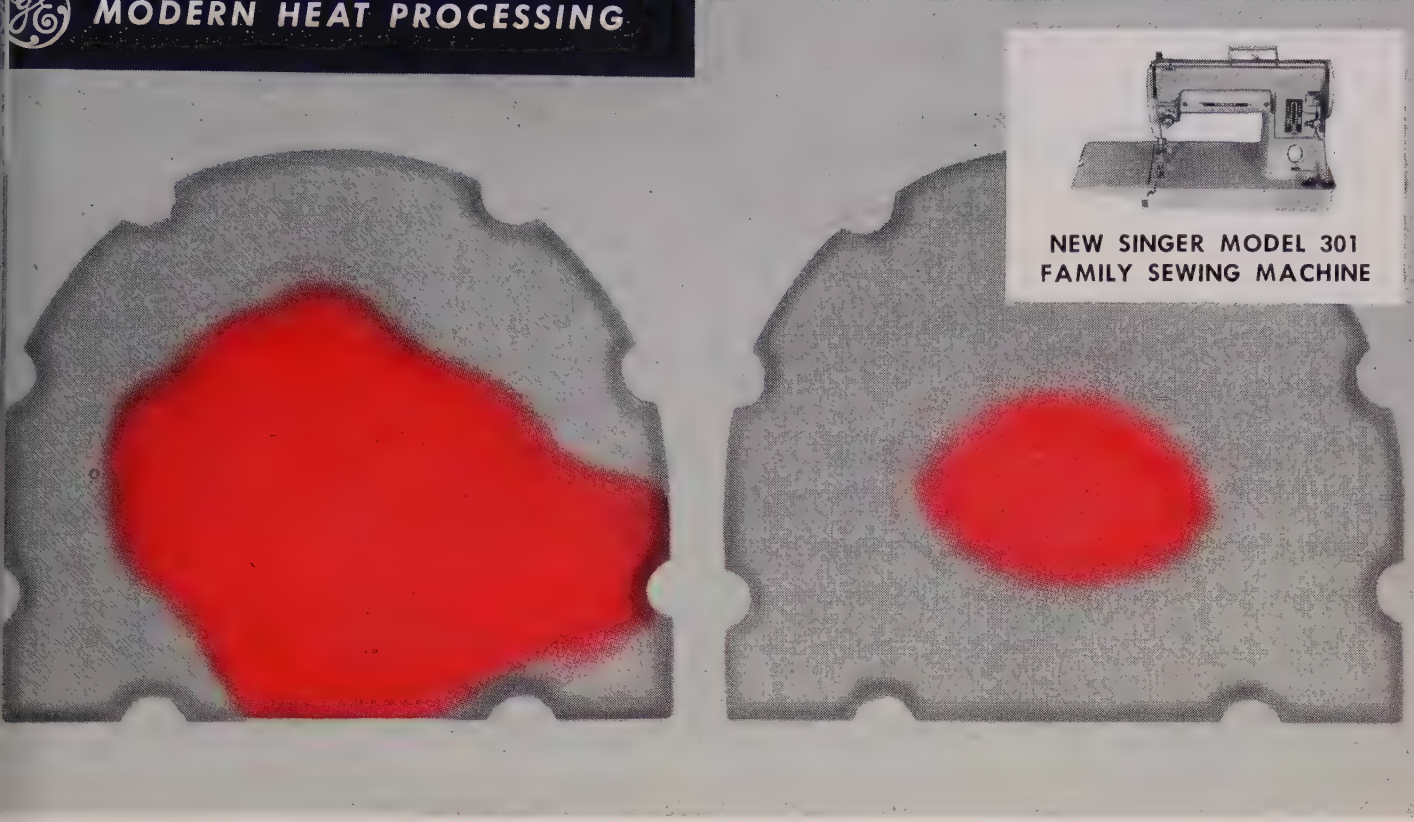
WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS–STRIP–RECTANGULAR, ROUND, FLAT RODS

TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

MODERN HEAT PROCESSING



NEW SINGER MODEL 301
FAMILY SEWING MACHINE

OLD METHOD hardened too much of part area, causing warpage. **G-E INDUCTION HEATER** cuts heat-treated area 75%—warpage reduced.

PROBLEM:

Old method of hardening SINGER Sewing Machine parts caused warpage, doubled costs

SOLUTION:

G-E Induction Heater "Pinpoints" Heat Reduces Costly Warping of Treated Parts

The Singer Manufacturing Company, Elizabethport, N. J. was having trouble hardening parts for its sewing machines. Only a small area in the high-carbon steel item needed hardening. But too large an area was being heated with the fuel-fired method used. This resulted in warpage. And subsequent straightening of the part was required. Result—high labor costs and production slowdowns.

A G-E 5-KW INDUCTION HEATER was selected because of its greater selectivity in heating the required area. Now the affected area is "zeroed in" with induction heat. The heated area is reduced 75%, thus greatly reducing the costly warpage. As a result, at least twice as many of these parts per day are being produced with the new 5-kw induction heater for the new SINGER 301 family Sewing Machine.

THE OVER-ALL IMPROVEMENT was explained by the manager of the heat-treating department of The Singer Manufacturing Company: "This method of heating has reduced the area affected by high temperatures to one-quarter of that obtained by the former method. With the G-E induction heater, the warpage is greatly reduced and straightening is no longer a problem. This improvement has produced more uniformly graduated marking on the finished parts and helped us to cut cost."

GENERAL ELECTRIC

G-E 5-KW INDUCTION HEATER

with variable tap transformer, handles jobs formerly requiring larger heaters.

For application assistance, contact your nearest G-E Apparatus Sales Office or send coupon for free bulletin GEC-920B.

General Electric Company
Apparatus Sales Division, Section A722-1
Schenectady 5, New York

Name.....

Position.....

Company.....

City.....State.....

Are Your Fasteners HEADED FOR TROUBLE?

Screws are sometimes like people. If they "lose their heads" under pressure — if they turn out to be "softies" — if they don't "square up," they are *headed for trouble*. It takes only a few "bad" screws on the line each day to erase most planned assembly savings.

That is why quality standards for P-K Self-tapping Screws were set so *high* when they were first introduced by Parker-Kalon. Today, with even *higher standards* they continue to take top honors for dependability, despite many efforts to match them.

The difference between screws made to P-K standards and those that are "headed for trouble" are hard to see at a glance, but the effects of screw failure (parts spoilage, high reclamation costs) are quickly evident in mounting assembly costs.

P-K Self-tapping Screws are "headed for savings"—not only headed, but threaded, pointed, and heat-treated with the same purpose, to keep your assembly lines trouble-free. That's why so many more manufacturers of America's best known products specify P-K. For information on any fastening problem, talk to a P-K Assembly Engineer. Or write: Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.

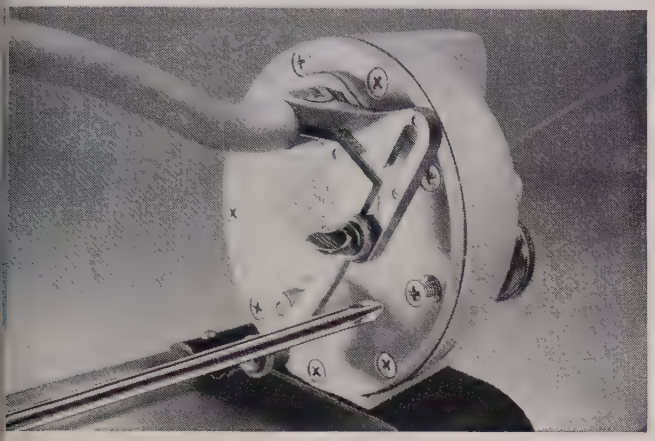
IS HEAD UNDERSIZE?
DO HEADS POP OFF?
IS HEAD ECCENTRIC?
IS SLOT BURRED?
IS SLOT TOO DEEP?
IS SLOT TOO SHALLOW?
IS SLOT OFF CENTER?
P-K STANDARDS make sure you get fasteners HEADED for SAVINGS

P-K STANDARDS protect you aga these and many other symptom Screws "headed for trouble". They d "get by" P-K inspectors — that's why P-K Self-tapping Screws can be "G anteed First Quality."

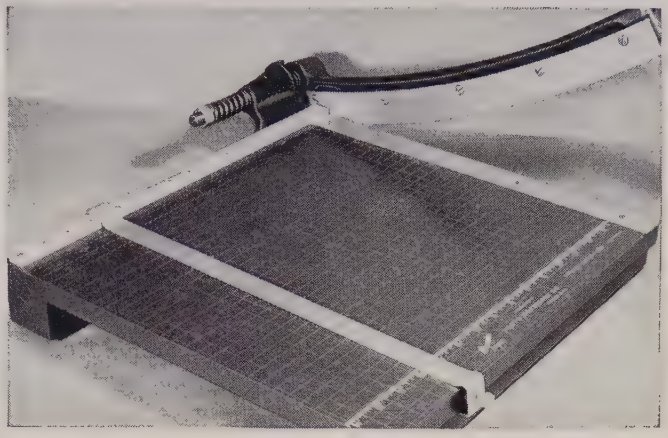
PARKER-KALON

IN STOCK . . . see your nearby P-K Distributor

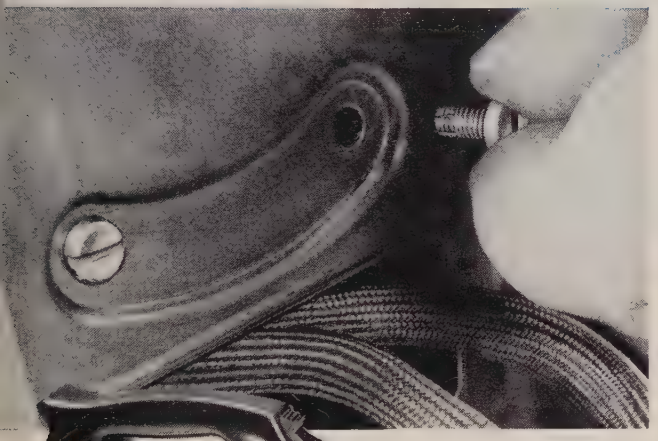
'WINGIN' SPRAY," MELNOR Products Co.'s popular lawn sprinkler eps on "swinging" because the oscillating mechanism is separate d sealed from the water intake system. To assure equally de- ndable assembly strength resistant to the roughest handling, elnor fastens zinc and aluminum parts with P-K Screws, 7 illips Head Type Z and 18 Type F, driven with air tools.



IN THE PREMIER CUTTING BOARD, made by Photo Materials Co., when 21 P-K Type A replaced wood screws to fasten the ruler, straight blade, bearing casting, and bottom cleats to the hard maple board, pilot holes were eliminated. The 5 P-K Type F Screws that now fasten curved blade to cast iron handle ended tapping. Power driving further speeds assembly.



with P-K quality-planned assembly savings pay off



HOOVER SMOOTHED OUT trouble and speeded assembly of this Steam or Dry Iron by switching to P-K Self-tapping Screws for seven fastenings previously made with machine screws. Tapping and lock washers were eliminated. The assembly is made stronger than ever, with an important saving in time. Five P-K Type F Screws fasten the phenol formaldehyde handle to the sole plate cover (left). On the assembly line, these screws are power driven. One P-K Type F Screw fastens the steam valve control support bracket to the die-cast aluminum filler tube at the front of the iron (not shown). One P-K Type A Screw fastens the heel closure plate to the terminal bracket (right).

The Original

SELF-TAPPING SCREWS

ur local Supply and Service Specialist

DIVISIONS OF
ASSOCIATED SPRING CORPORATION
COAST TO COAST

WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT

THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE.
CHICAGO 14,

RAYMOND Manufacturing COMPANY
CORRY, PENNSYLVANIA

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MILWAUKEE DIVISION
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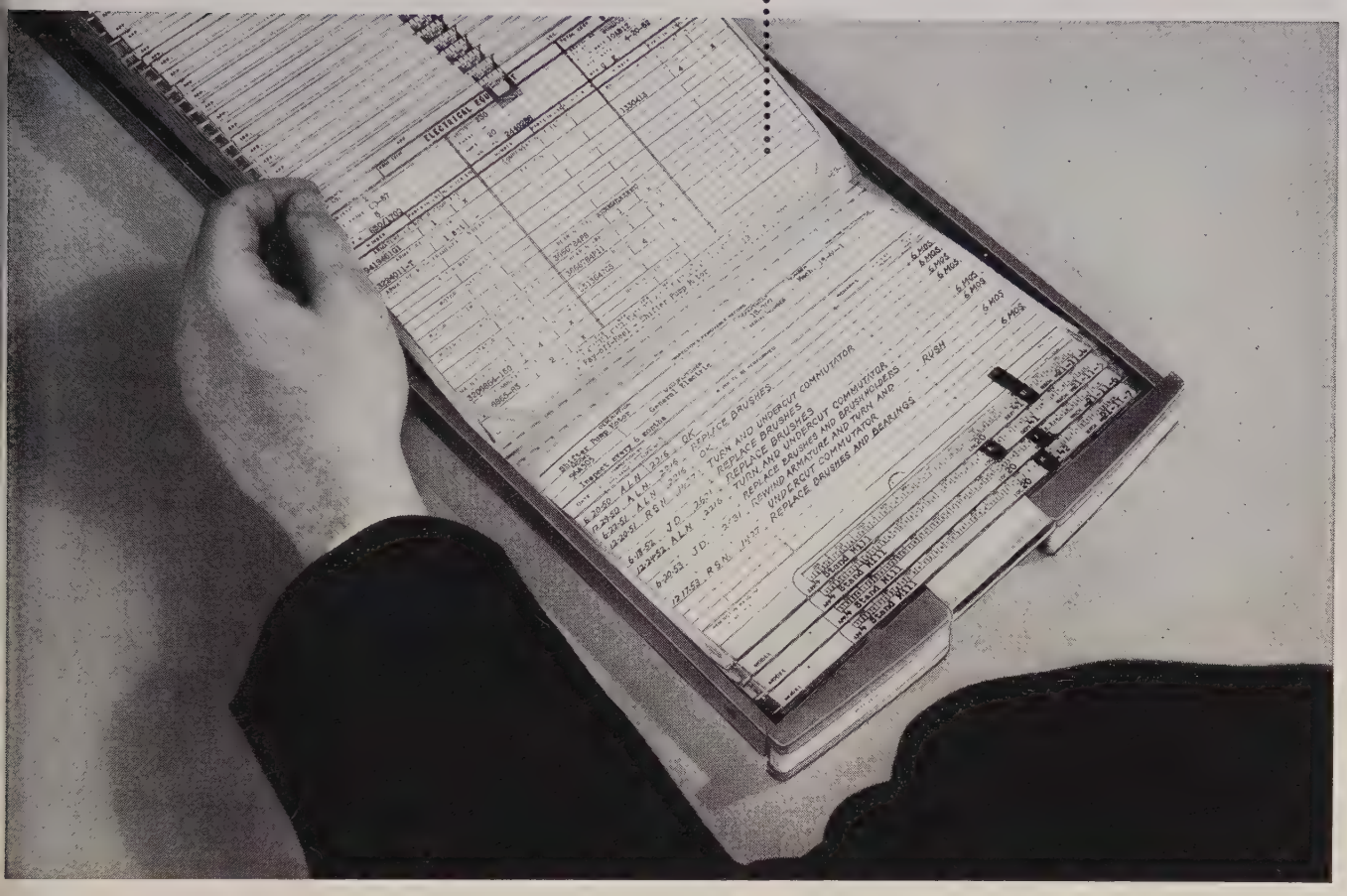
BRISTOL, CONN.

F. N. MANROSS AND SONS CO.
BRISTOL
CONNECTICUT

THE WALLACE BARNES CO., LTD.
HAMILTON
CANADA

here's the key to a

SUCCESSFUL MAINTENANCE PROGRAM



THE REMINGTON RAND KARDEX record combines in a single pocket, ready for instant reference, the complete history of the machine, machine characteristics, repetitiveness of repairs and a record of maintenance service and costs.

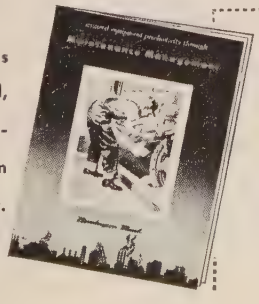
Through the use of colored signals the preventive maintenance program is visibly signalled, allowing you to analyze your preventive program at any time *in a matter of seconds*.

You will also need an inventory control system for spare parts. An effective stores control system is as important to your maintenance control program as is your work force. Without proper inventory control of parts, valuable production will be lost and machine down time will be greatly increased.

Both of these records are shown in our booklet on Maintenance Management. This booklet also contains information on how to:

1) Keep Within Your Operating Budget
2) Reduce Emergency Work Through Planned Maintenance
3) Schedule Man-Hours and Cut Idle Time

send today for this 8-page booklet which shows in detail, in flow-chart form, how you can streamline your whole maintenance operation at the lowest clerical and equipment cost.



Remington Rand Inc.

Room 1442, 315 Fourth Ave., New York 10

Kindly send your free booklet "Assured Equipment Productivity Through Maintenance Management"-X1383.

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

NEW CARMET®

STEEL-CUTTING CARBIDES

1 INCREASE PRODUCTION 2 GIVE UP TO 50% LONGER LIFE

DETAILS OF JOB ILLUSTRATED

Machine	Sundstrand Rigid Mill
Cutter Size	10" Diameter
No. of Teeth	12
Carbide Inserts (grade)	Carmet CA-610
Rate of Travel	400 S.F.P.M.
Table Speed	10 in. per minute
Depth of Cut	½ inch
Material	1095 Cold Drawn Shank Steel, 200 Brinell

READY FOR YOU

Complete Technical and Shop Data on the Carmet "CA-600 Series" of special steel-cutting Carbides

Write for Your Copy

ADDRESS DEPT. S-642

Here's something *special* for you: the new Carmet steel-cutting grades of carbide, called the "CA-600 Series." One of the grades is shown above in a milling operation—a tough job where the major requirement was continuous production. Cutters equipped with Carmet CA-610 inserts not only increased the production of the machine on this job, but actually gave 50% longer life than the comparable cutting materials previously used.

These heavy-duty CA-600 Carmet grades (premium products in performance, *at no premium in price*) have been thoroughly job-proved in the field. They're available to fit *your* steel-cutting requirements . . . *let us arrange a demonstration of their ability to save time and money for you.* Get in touch with your nearest A-L representative or distributor, or address *Allegheny Ludlum Steel Corporation, Carmet Division, Detroit 20, Michigan.*

For complete **MODERN** Tooling, call

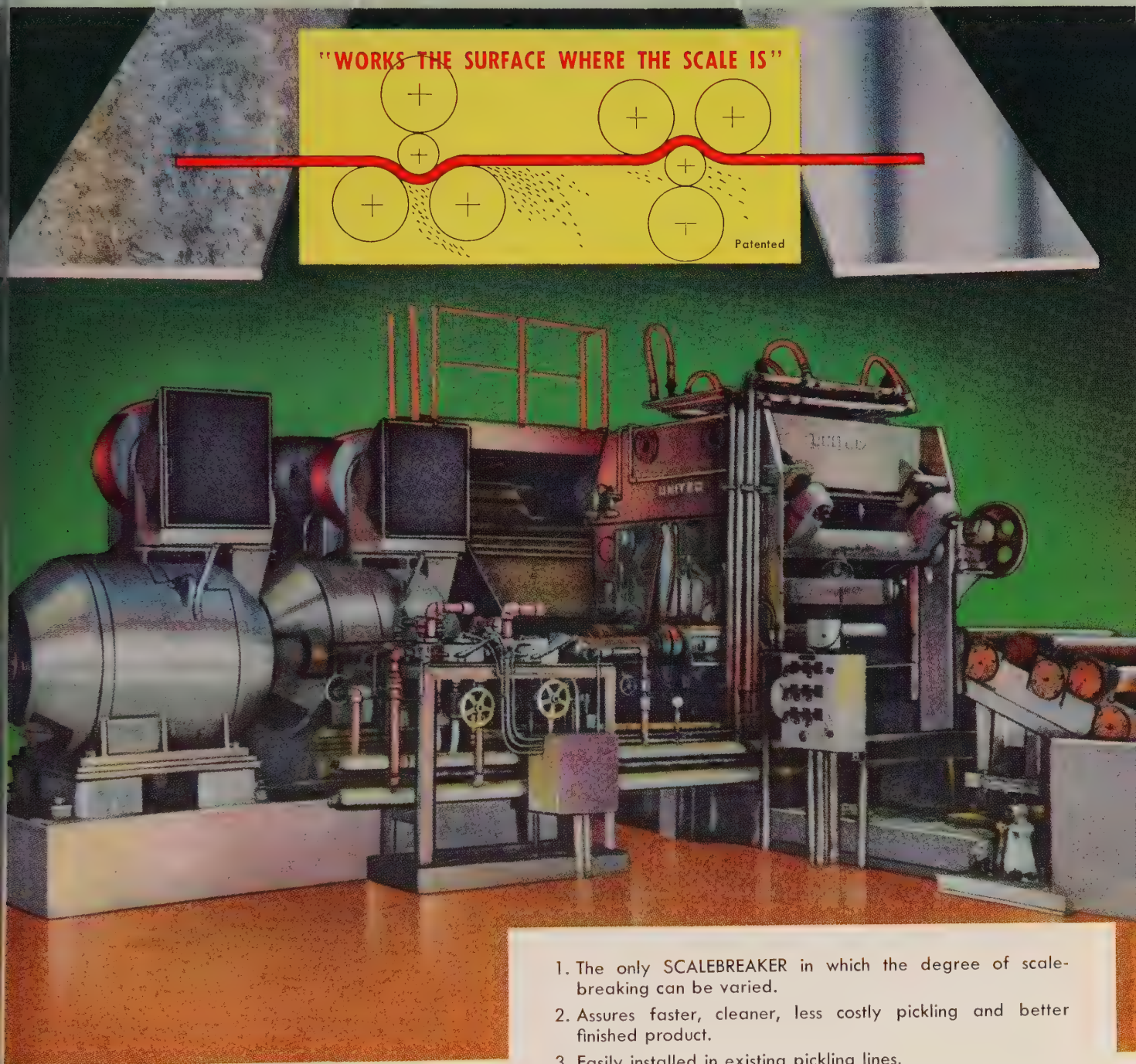
Allegheny Ludlum®

WOD 5544

AL FINE TOOL STEELS SINCE 1854

UNITED®

NEW *Strip Processing* SCALEBREAKER



1. The only SCALEBREAKER in which the degree of scale-breaking can be varied.
2. Assures faster, cleaner, less costly pickling and better finished product.
3. Easily installed in existing pickling lines.

Write today for complete engineering data.

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington (Lobdell United Division)

Subsidiaries: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Quantity
PRODUCTION
of
GREY IRON CASTINGS

*

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

*

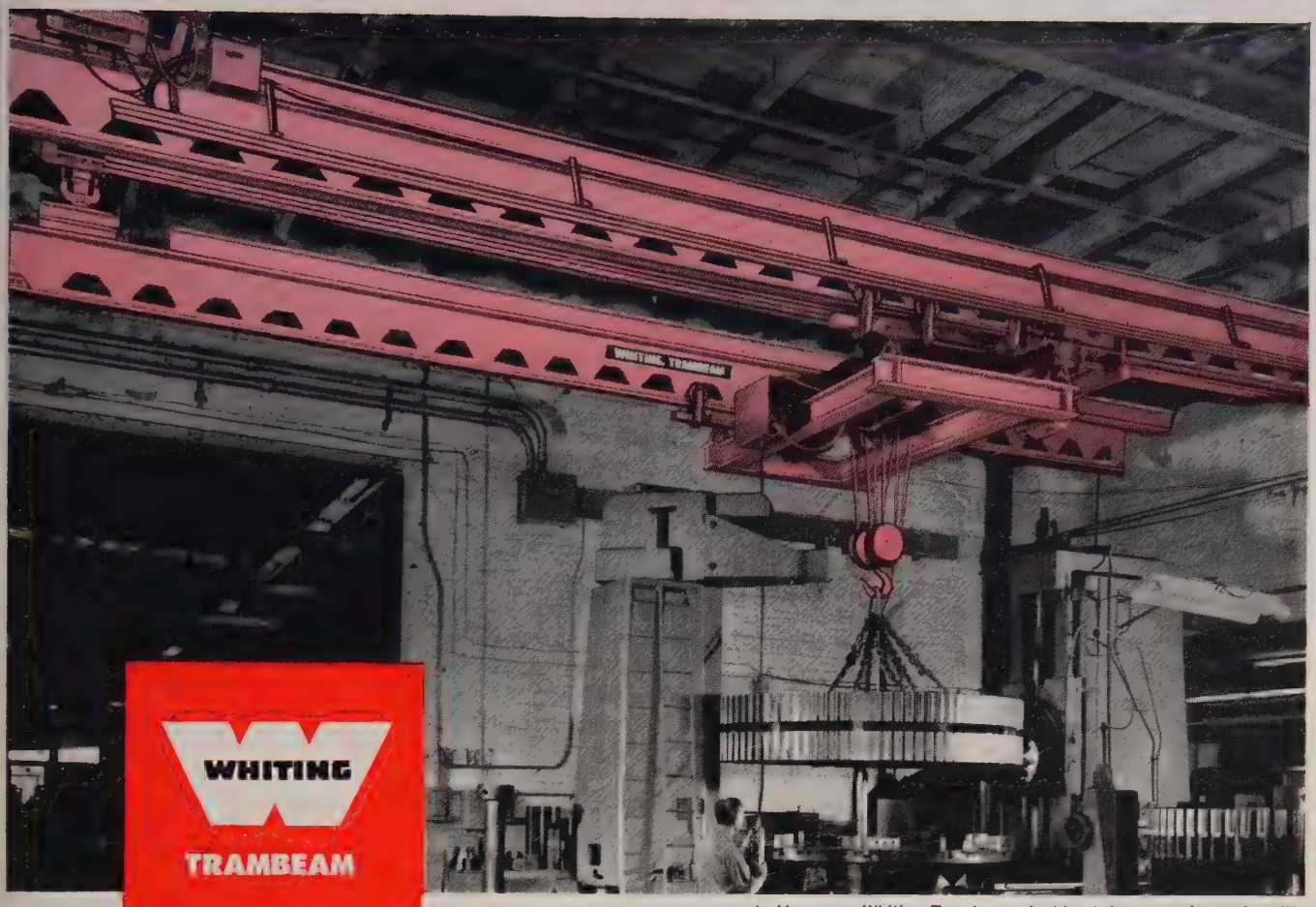
ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE



At Verson, a Whiting Trambeam double-girder crane is used to lift a set of gears (weighing 5 tons each) from the cutting machine.

AT VERSON ALLSTEEL PRESS COMPANY

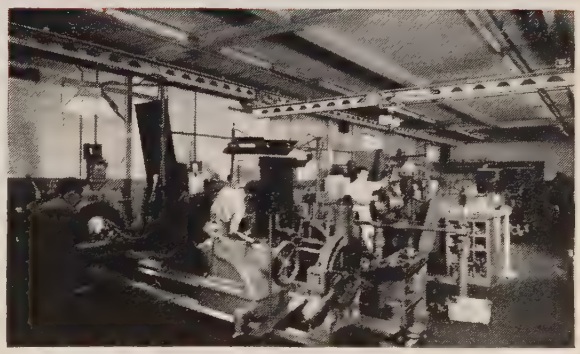
Men get a lift...Costs go down!

Moving and lifting materials or products is a major cost factor faced by practically every company. Many, like Verson Allsteel Press Company, Chicago, do something about reducing these costs. Machine operators at Verson use versatile Trambeam Overhead Handling Systems to move and lift the heavy gears they work upon. Trambeam does the job safely and quickly . . . and the operators handle 10-ton loads with little effort. Time and money are saved in *handling* —manhours are devoted to *production*.

Your local Trambeam distributor will help *you* save money in handling. Talk to him now—his experience is of great value. We will give you complete information on Trambeam Cranes for fast, flexible, complete area coverage—on monorail for point-to-point transport and on installation of the complete system. Write today and ask for a free copy of the Trambeam catalog and the name of your Trambeam Distributor.

WHITING CORPORATION
15643 Lathrop Avenue, Harvey, Illinois

OTHER WHITING PRODUCTS
Trackmobile • Overhead Cranes • Electric Chain Hoists • Electric Furnaces • Evaporators and Spray Dryers

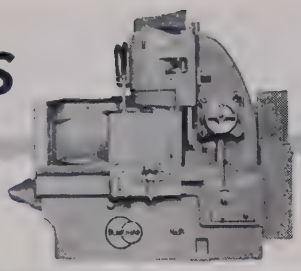


Fast, safe handling of parts to and from machines is provided by a single girder Trambeam crane and Whiting electric chain hoist in the tool room.

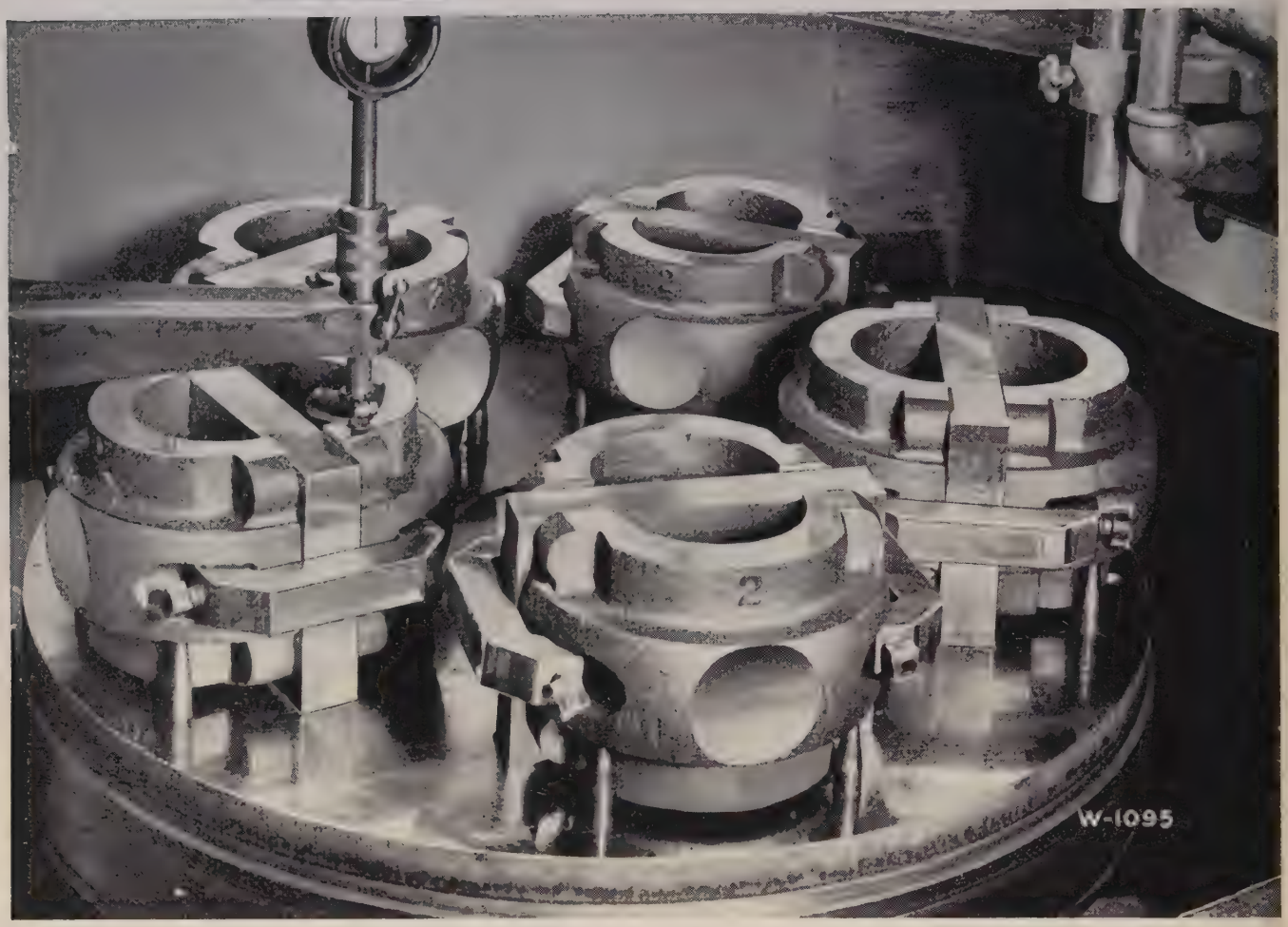
Trambeam offers all industry outstanding best buy features

- High carbon rails assure long life operation.
- Flexible suspension minimizes bending fatigue and keeps load stress vertical.
- Friction-reducing carrier design has Timken double row, tapered roller bearings.
- Underhung carriers provide maximum headroom, greater speed and improved control.
- Capacities up to 15 tons with full electrification.

IT PAYS



TO PUT IT ON A BLANCHARD



The first operation on these cast steel (1504) bearings is to Blanchard grind the parting line to establish locating surfaces.

Then, a No. 18 Blanchard Surface Grinder (shown above), with 36" magnetic chuck, rough grinds the end faces of all five sets in 17 minutes—at an abrasive cost of only 2¢ per piece! This operation provides locating surfaces for additional machining. By using the correct Blanchard wheel* and proper rate of down feed, the wheel dresses itself and removes three cubic inches of cast steel per minute.

The final Blanchard operations include finish grinding both end faces—removing .015" of stock from each end, flat and parallel to ±.001". Each surface is ground in 17 seconds, fourteen pieces to a load, located directly on the magnetic chuck.

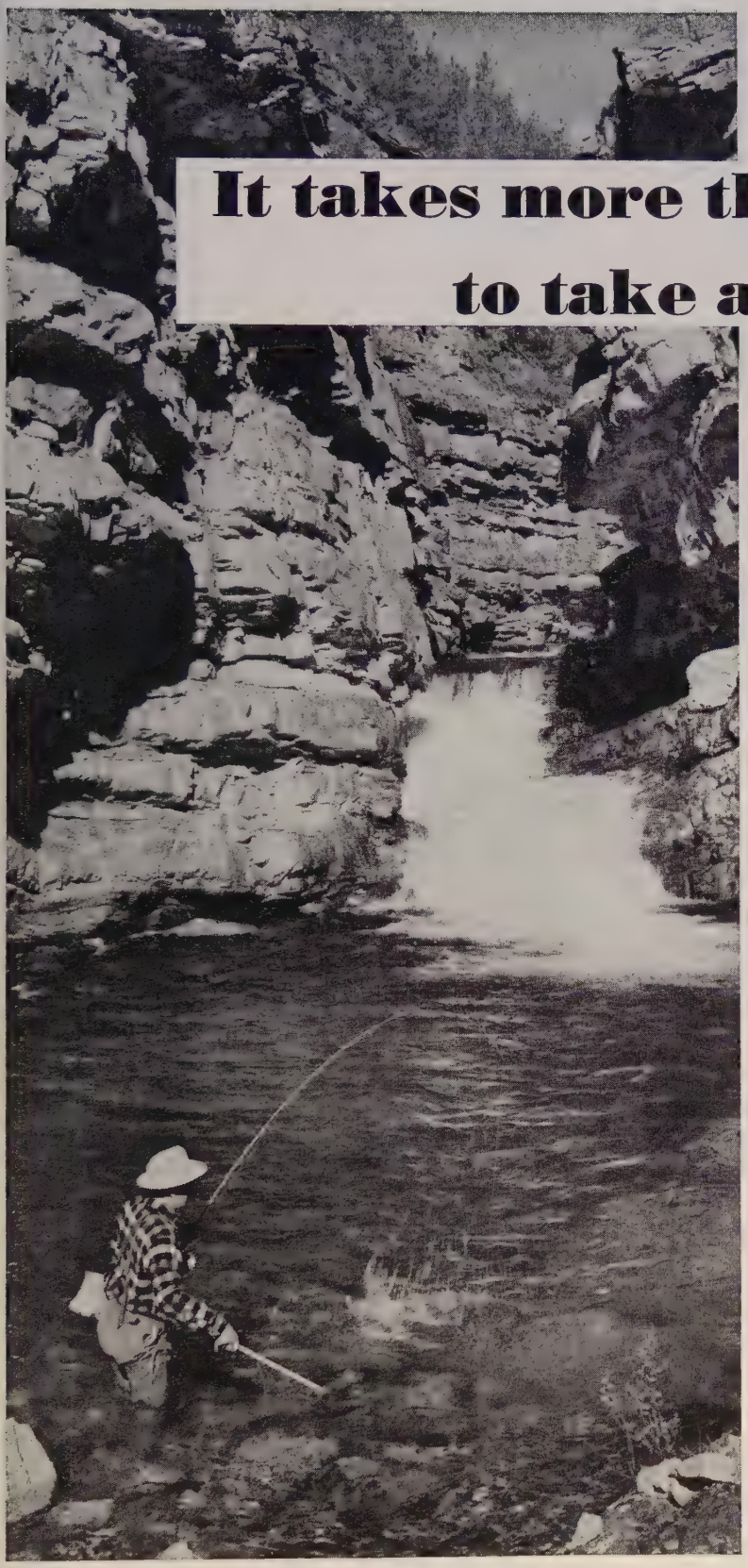
**Blanchard Grinders perform best with Blanchard Wheels!*

Send for your free copies of "Work Done on the Blanchard", fourth edition, and "The Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.



It takes more than a good fly to take a trout

Even the costliest fishing gear, the finest rod, the best reel and the prettiest fly can't assure catching a wily trout. It's the experience behind these accessories, that fills the creel.

There's no substitute for "Know-How" and that's particularly true in adapting metal treating chemicals to established production. It can't be gotten out of books, through black magic or out of a crystal ball. Only years of active contact, with actual manufacturing procedures, can be depended upon for satisfactory solutions of the metal protecting problems constantly confronting manufacturers.

ACP offers ideal products for removing and preventing rust on metal, chemicals to bond paint to steel, zinc, and aluminum, and pickling acid inhibitors. In addition, ACP furnishes a free service of an organization of technical experts with over 40 years' experience in solving metal preservation problems for the largest as well as the smallest operation.

Rely on service backed by experience. You are obligated in no way by consulting our technical staff.

Write or call for further information on ACP chemicals for metal protection.

Since 1914, Pioneering Research and Development in Metal Protection

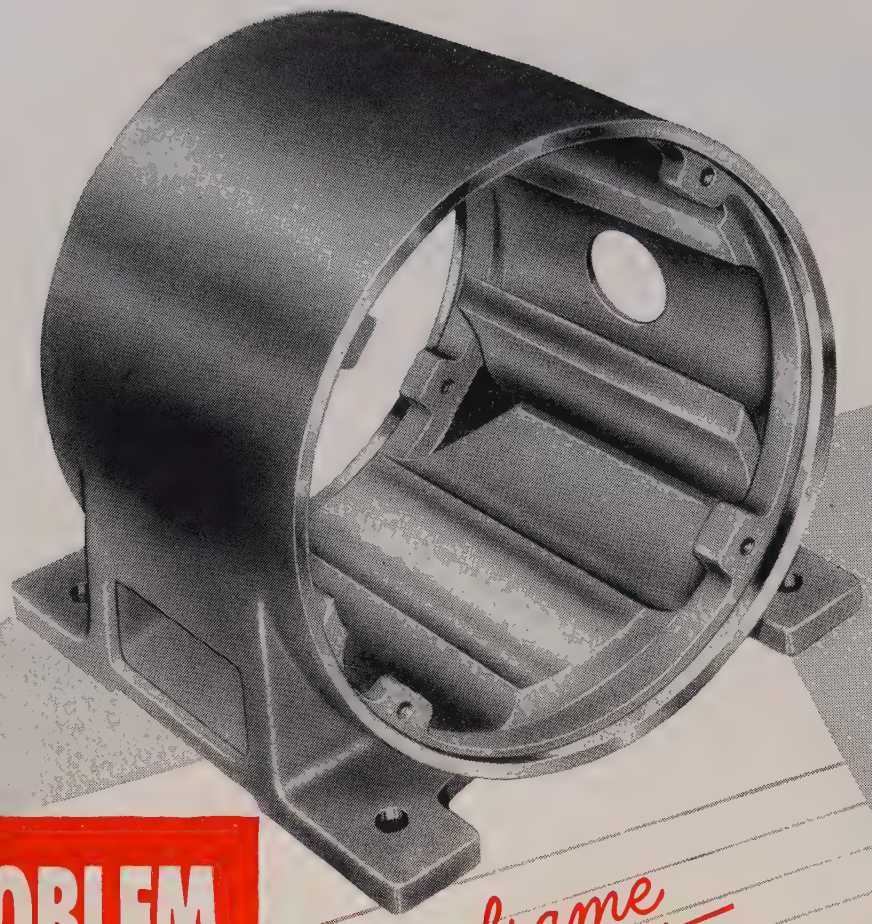
CHEMICALS ACP PROCESSES

AMERICAN CHEMICAL PAINT COMPANY

CHEMICALS ACP PROCESSES

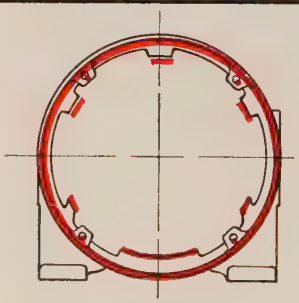
AMBLER, PENNA.

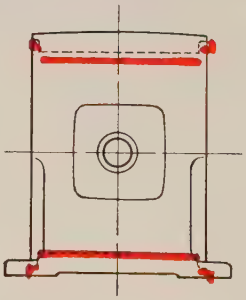
DETROIT, MICH. NILES, CALIF. WINDSOR, ONT.



PROBLEM

1. lower stator frame machining costs.
2. increase production and accuracy
3. run any one of four different size parts





MACHINING NECESSARY

Drill 8 holes	Bore two inside diameters
Chamfer 8 holes	Rough face ends
Tap 8 holes	Remove chips

for problems in Drilling, Boring, Facing and Tapping

Call a Natco Field Engineer

CHICAGO, Room 203, 6429 W. North Ave., Oak Park
DETROIT, 10138 W. McNichols Rd. • BUFFALO, 1807 Elmwood Ave.
NEW YORK, 35 Beechwood Ave., Mount Vernon

NEW NATCO HOLEWAY

cuts costs and increases production . . . and accuracy by combining operations!

SOLUTION

ESTIMATED GROSS PRODUCTION

30 PARTS PER HOUR

(ANY ONE OF FOUR DIFFERENT SIZE PARTS)

OPERATIONS

STATION No. 1
Load 1 part.
STATION No. 2
R. H. Horizontal Head
Combination rough bore for 10.492/10.490 half thru, rough bore for 12.064/-12.062 diameter, finish bore 10.520/10.510 diameter and rough face end.
L. H. Horizontal Head
Drill 4 holes

STATION No. 3
Idle
STATION No. 4
R. H. Horizontal Head
Drill 4 holes
L. H. Horizontal Head
Combination rough bore for 10.492/10.490 diameter rough bore for 12.064/12.-062 diameter and rough face end.

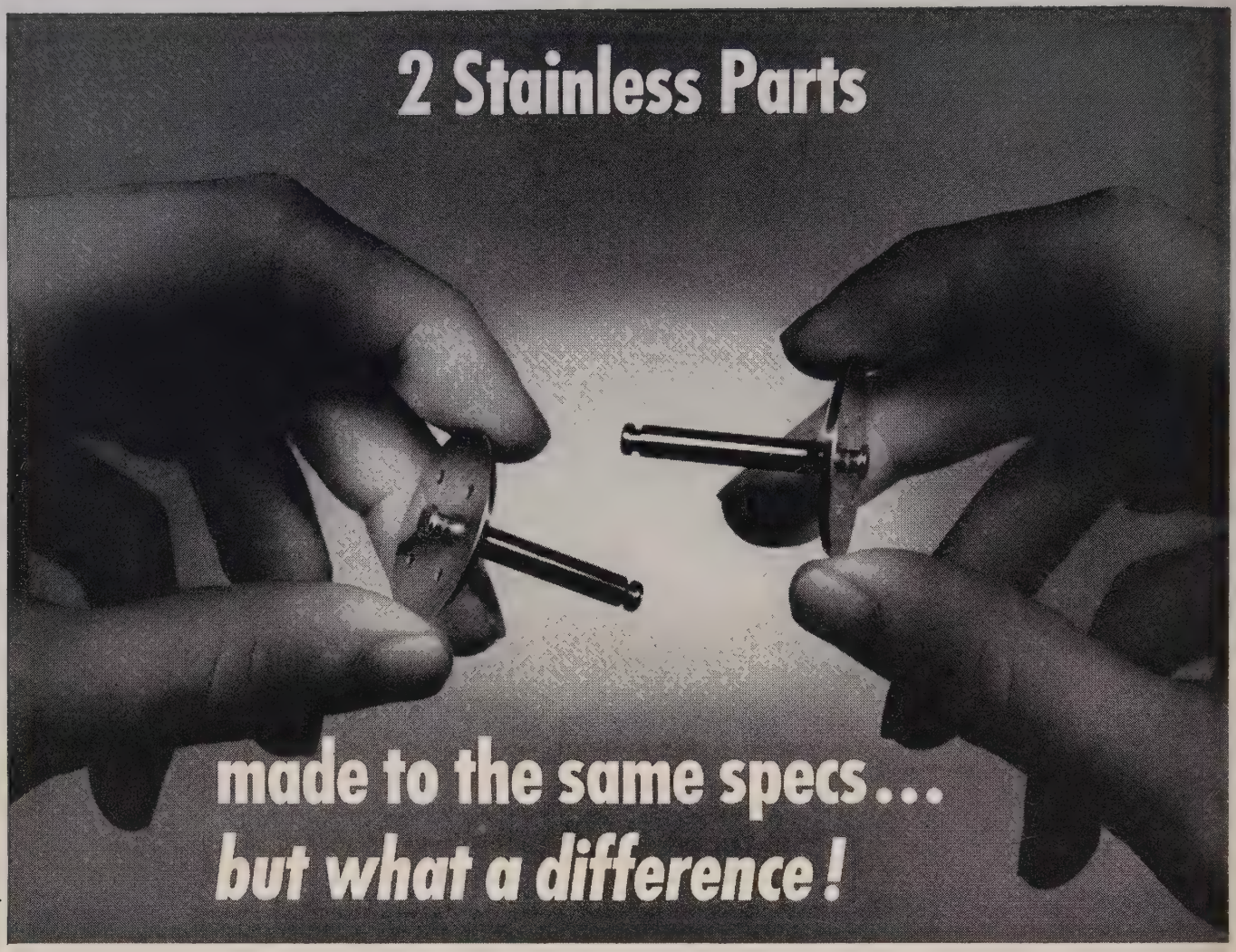
STATION No. 5
Idle
STATION No. 6
R. H. Horizontal Head
Tap 4 holes
L. H. Horizontal Head
Tap 4 holes
STATION No. 7
Idle
STATION No. 8
R. H. Horizontal Head
Idle

L. H. Horizontal Head
Finish bore to 10.492/10.490 diameter thru.
STATION No. 9
Blow chips out of center bore and 8 tapped holes (4 each side) and blow chips off top.
STATION No. 10
Unload 1 part. Part to be unloaded onto gravity conveyor.

NATIONAL AUTOMATIC TOOL COMPANY, INC.

RICHMOND, INDIANA

NATCO



Machining costs are 25% lower

This valve is used for a fuel return regulator check. Although the manufacturer was one of the first to use Carpenter Stainless No. 8 (Type 303) when it was first introduced, there have been occasions and conditions which required the use of ordinary makes of Type 303 Stainless Steels. The customer reports: Carpenter No. 8 *consistently* enables them to show a 25% saving in machining costs because of its constant uniformity and easier machinability.

Reject rate is reduced

An important requirement of this valve is that it be "leak-proof" in operation under pressure. To assure a tight seal, some surfaces are machined to a 5 or 10 micro-inch finish with tolerances as close as .0005". Because of the machinability and finishes obtained with Carpenter No. 8, rejects always take a sharp drop when compared with competitive Type 303 Stainless Steels.

Machine operators are happier

Here's an interesting sidelight: Machine operators can always spot an ordinary Type 303 without being told, because of the way it cuts in the machines. With Carpenter No. 8 they tell us they *know* the job will run smoother and faster with improved results. The same thing can apply in your *own* plant. So if you're looking for a way to improve performance and reduce costs on your stainless parts, CHANGE to Carpenter No. 8. See what the difference can mean to you. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

take the problems out of production

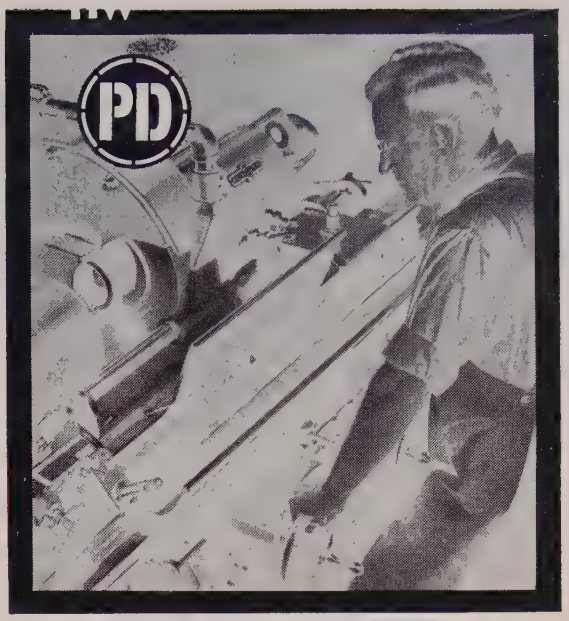
...change to Carpenter STEEL

Free-Machining Stainless

IMMEDIATE DELIVERY from local warehouse stocks!
Export Department: The Carpenter Steel Co., Port Washington, N.Y.— "CARSTEELCO"

The most talked about development in years...

JUST AS A NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a . . .



. . . POSITIVE DUPLICATION of an original grinding wheel each and every time through the CINCINNATI (PD) Manufacturing Process.

NOW!

Cincinnati Grinding Wheels offer

PD **Positive Duplication**

No wonder the good news about Positive Duplication is causing so much excitement. For (PD) is an outstanding development in precision manufacturing and quality control that can *save you money* . . . and *increase your production.*

Through the CINCINNATI (PD) Manufacturing Process you are assured a Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

Investigate! Let us prove to you how CINCINNATI (PD) WHEELS can save you money and increase your production. Just contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

CINCINNATI
Grinding Wheels

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

For Better Contour Cutting...

gives you more cuts, longer life, lower costs!

Here's a tough, edge-holding metal cutting band saw blade that gives you a real bonus in smooth, fast cutting and long life.

Made of extra tough, wear-resistant alloy steel, Simonds "Bonus" Bands have sharp, perfectly formed teeth — set with absolute evenness on both sides of the blade. Hardened along the tooth edge only by controlled heat treatment, they combine maximum cut-ability with flexibility and resistance to breakage, provide the ultimate in trouble-free service.

All standard widths and tooth spacings are furnished in 100′ and 250′ coils or welded to specified length. Ask your local Simonds Industrial Supply Distributor for more information on the complete line of Simonds "Bonus" Band Saws.

For Fast Service from Complete Stocks

Call your **SIMONDS Industrial Supply DISTRIBUTOR**

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.
Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

NOW! ONE WELDER

IDEALARC... GIVES YOU

BOTH AC and DC

WELDING CURRENT

NOW
DC Industrial Welder for operation on single phase power lines

NOW
Rectifier Welder with both current and voltage controls

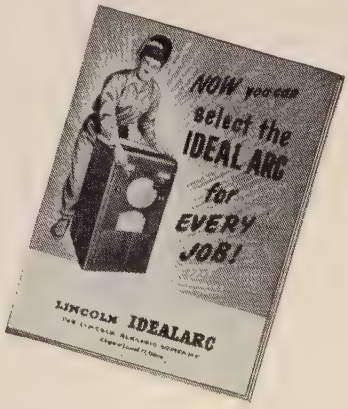
NOW
Rectifier Welder with arc-booster starting

● One machine, Lincoln Idealarc, now gives you *both* AC and DC welding current. You have *both* current control and voltage control. For every job, you can now select the ideal arc . . . soft arc or forceful arc . . . AC or DC.

Shops which do not have 3 phase power can now use DC. Idealarc is the only DC welder to operate from single phase power available at reasonable prices in industrial sizes.

With dual arc control on DC, you have the same benefits of soft arc and forceful arc for welding with DC as with AC. Arc-booster starting on both AC and DC . . . on both soft arc and forceful arc . . . assures non-sticking, easy operation, speeds intermittent welding, gives full penetration at the start of each weld.

Idealarc cuts duplication of welding equipment . . . saves on welder cost. So why tie down your operations with one choice of welding current? Idealarc provides complete freedom to select the correct arc type and welding current for maximum speed, maximum ease and quality of welding . . . for the same investment.



SEND FOR FACTS

Send for Bulletin 1343

Shows how you can cut welding costs . . . now. Write:

THE LINCOLN ELECTRIC COMPANY

DEPT. 1603, CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

INLAND 4-WAY PATTERN
PROVIDES SURE FOOTING

SAFETY PLATE...*quick delivery*

The next time you're looking for an answer to an under-foot problem where sure traction, easy maintenance and long wear are important, call Ryerson for Inland 4-Way Safety Plate.

The lugs in this attractive Inland pattern are hot rolled at right angles to each other to provide safe footing in all directions. There are no pockets where liquid or dirt can collect, so the surface is easy to drain and sweep.

This firesafe, long-lasting plate is available in two pattern sizes and a wide range of thicknesses. You can order it sheared, bent or punched to your specifications. For immediate shipment of one piece or a truckload, call your nearby Ryerson plant.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished

ALLOYS—Hot rolled, cold finished, heat treated

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

TUBING—Seamless & welded, mechanical & boiler tubes

STRUCTURALS — Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal fabrication

RYERSON CERTIFIED STEELS

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

STEEL
April 25, 1955

Metalworking Outlook

No Summer Slump?

Prospects that auto assemblies will hold up through the summer are brightening. New car inventories are relatively low (640,000 on Apr. 1) and demand is high. Ford Motor Co. is considering adding a second shift at its new Louisville assembly plant this summer, demand warranting. The plant will reach a single-shift output of 440 units a day within the next few weeks. Employment is 2000. A full second shift would raise it to 3700 and push output to nearly 900 units daily.

Revolt Vs. Auto Wage Pattern

American Motors Corp. may lead the way in a revolt against pattern wage settlements in the auto industry. Traditionally, the United Auto Workers signs up the Big Two or Big Three producers. Then smaller assemblers and many parts suppliers follow. In negotiations which began last week on its contract, AM said it could afford no guaranteed wage pattern. The UAW answer: A pooled fund for smaller companies whereby each participating firm would put set amounts into a central fund. That money would be distributed in guarantees as the need arose.

The Silent Mr. Lewis

Improving business in bituminous coal may break John L. Lewis' long silence on his wage contract, with a demand for a new one. The agreement negotiated on Sept. 20, 1952, provided for indefinite continuation, subject to 60 days notice. Because of the doldrums in coal, he has not given notice. Now production is running about 13 per cent ahead of last year.

Research on Enameled Foil

Porcelain enamel on aluminum foil may become a construction material of the future. Reynolds Metals Co. is conducting experiments in co-operation with enameling companies. They hope to obtain a material glued to plywood or similar backing to provide a glass-on-wood exterior or interior wall panel, which can be coiled for shipment.

A Look at 1960

We could produce a total national output as high as $490 billion by 1960 if: 1. Unemployment is no greater than it is today. 2. With working hours about the same. 3. With productivity rising 35 per cent in the 1950s (it rose 47 per cent in the 1940s). So predicts the Twentieth Century Fund. At present rates of growth, it says, we will have a population of 177 million in 1960. Some 69 million should be at work or in the armed services.

Two Titanium Hearings?

Air Force use of titanium will go up by some 40 per cent in the last three months of this year, according to present requirement estimates submitted

Technical Outlook—p. 95 Market Outlook—p. 127

to mobilization agencies. But those needs are still running substantially below previously estimated levels. Two Senate committees are trying to find out why. One group, headed by Sen. W. Stuart Symington (Dem., Mo.) has completed preliminary digging. It will evaluate its information in the next week or so to decide if public hearings are necessary. Sen. James E. Murray (Dem., Mont.) will definitely hold hearings on the subject, now tentatively set for early May.

Metal Matters

Look for no reduction in copper and steel scrap export quotas this quarter. For steel, a study will be made that may mean cuts for the third quarter. The military requirements for aluminum and copper still drop, but the steel take is rising slightly. For the third quarter "A" products designed for military or Atomic Energy Commission equipment will take 106,223,905 lb of aluminum, compared with 109,016,377 for the second quarter; 57,834,402 lb of copper, compared with 62,085,752; and 696,958 net tons of steel, compared with 681,003. An Office of Defense Mobilization study claims that in an all-out war (assuming no bomb damage to capacity) we would have a shortage in capacity to make cold-finished steel bars, wide steel plates, shell-quality steel bars, armor castings, heavy aluminum extrusions and aluminum forgings.

Needed: Upgraded Manganese

Watch for a five-year governmental research program to make low-grade domestic manganese ore usable. Clarence A. Fredell, chief engineer of General Services Administration's Emergency Procurement Service which has charge of the project, says it would cost about $3 million. If the U.S. were willing to spend $70 million a year to support a domestic industry producing upgraded manganese, Mr. Fredell estimates that 1 million tons of 48-per-cent manganese could be obtained. That would make us about 50-per-cent self-sufficient.

Straws in the Wind

U.S. primary aluminum production hit 260,543,479 lb in March and 749,423,226 lb in the first quarter, an all-time record month and quarter . . . Stockholders have approved the sale of Mackintosh-Hemphill Co. It will become a division of E. W. Bliss Co. . . . Bethlehem Steel Corp. is investigating an iron ore development in French Equatorial Africa . . . Last week, the President's Advisory Committee on Transport Policy proposed revamping basic legislation to aid the nation's common carrier system and the ailing railroad industry in particular.

This Week in Metalworking

Business will continue good, predict delegates to the triple mill supply convention (p. 53) . . . What happens when a smaller company is absorbed by an industrial giant? (p. 54) . . . First quarter steel earnings were good (p. 55) . . . Atomic power: New markets for metalworking (p. 56) . . . Western Electric Co. saved $400,000 by improving packaging (p. 59).

For...

General-Purpose Sawing

with High Speed Accuracy, Economy

Model 4B/M2/E2
Equipped with standard work track
(Optional Equipment).

Let us prove to you the many reasons why this MARVEL Hack Saw offers the cheapest, most accurate and fastest "cut-off" method available to you at a low initial cost.

Ask your dealer, or write us for Bulletin GP35 which fully describes and illustrates the many exclusive features which makes this Hack Saw Machine your "best buy".

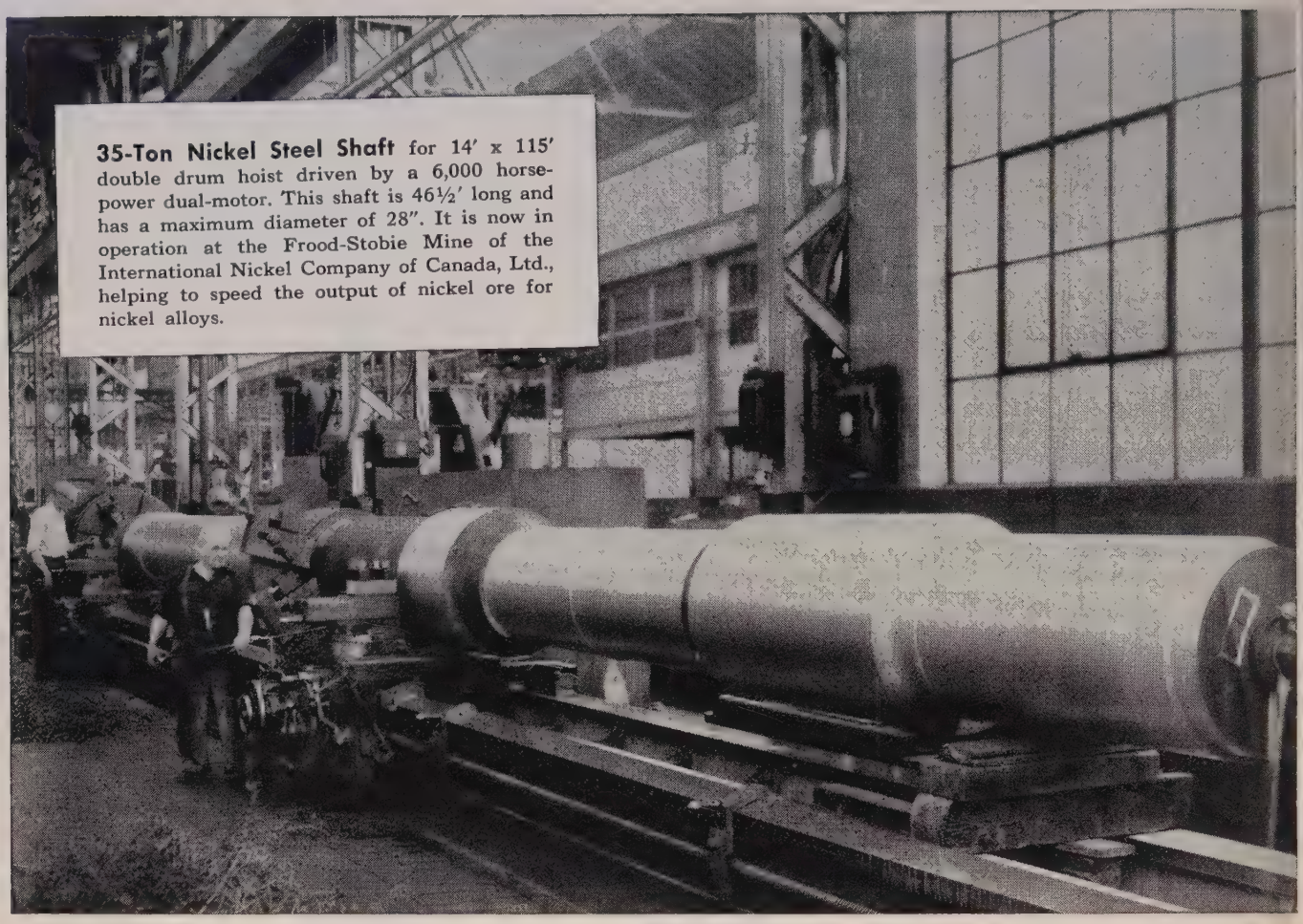
MARVEL No. 4B
HIGH SPEED HACK SAW

Exclusive features

1. Horizontal Ball Bearing Saw Frame.
2. Screw Feed—Automatic or Hand Operated.
3. Quick Return Stroke—allows greater number of strokes per minute.
4. Simple Positive Coolant System.
5. Adjustable Stroke—can be shortened for larger capacity.
6. Speed Range—available in 1, 2 or 4 speed models for wider range of work.

Metal Cutting
MARVEL SAWS

ARMSTRONG-BLUM MFG. CO. • 5700 Bloomingdale Avenue • CHICAGO 39, ILL.



35-Ton Nickel Steel Shaft for 14′ x 115′ double drum hoist driven by a 6,000 horsepower dual-motor. This shaft is 46½′ long and has a maximum diameter of 28″. It is now in operation at the Frood-Stobie Mine of the International Nickel Company of Canada, Ltd., helping to speed the output of nickel ore for nickel alloys.

How nickel strengthened the shaft for

Canada's highest powered mine hoist

IN LARGE FORGINGS such as this giant shaft, high tensile and elastic properties do not come easily.

Liquid quenching of heavy forgings is usually impractical. Even when the shape is such that this treatment may be safely applied, the section sizes involved often restrict cooling to rates which render the quench ineffective.

Increased strength, hardness, toughness and other mechanical properties in a large forging depend to a great extent upon selection of alloy content.

Accordingly, to attain maximum strength and toughness in the shaft of Canada's highest powered mine hoist, at our own Frood-Stobie mine, we specified a shaft forged of 3½% nickel steel . . .

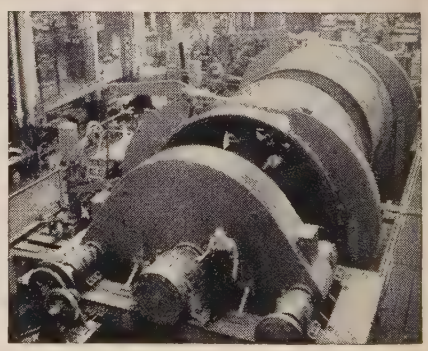
Because nickel, either alone or in combination with other alloying elements, provides a number of advantages.

For one thing, it has a strengthening effect on ferrite . . . independent of carbon content or heat treatment of the steel.

For another, it lowers the rate and temperature of the upper transformation, thus inducing better response to the necessarily milder heat treatments used. And it reduces grain growth.

Whenever you face a metal problem, let us help you make a selection that will meet your particular fabricating and service requirements. Send us details of your applications, for our suggestions.

INCO
TRADE MARK



Double Drum Hoist for the Frood-Stobie Mine, during course of shop erection by the builder, The John Bertram & Sons Co., Ltd., Dundas, Ontario. Spiders that support the steel shell of the hoisting drum were cast in an iron containing 1½% nickel . . . to assure adequate strength in the 74,600-pound drum-spider assembly. This hoist, operated by push button control from a station far underground, can lift skips containing 15 tons of nickel-copper ore, at an average rate of 14,000 tons daily.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET
NEW YORK 5, N.Y.

What Price Marketing?

Selling and distribution costs are taking a bigger slice of the metalworking sales dollar than they did five years ago. A National Industrial Conference Board survey shows an upward trend from 1950 through 1954. Despite a larger volume of business in 1955, more companies report marketing costs, as a percentage of sales, are on the increase than those that report them to be declining.

Significant is the wide variance in the proportion of the sales dollar going for selling and distribution costs among the companies studied. The low is 1.3 per cent for a heating and plumbing supplies producer; the high is 54.5 per cent for an office equipment manufacturer. Average for all metalworking companies is roughly 10 per cent.

Many reasons are cited for the bulge in marketing costs. Some companies disclose they are selling more to civilian customers, less to the government. Some say increasingly competitive conditions over the last several years have called for harder selling and have caused sales expense ratios to climb accordingly. Others indicate the increase stems from management's growing awareness of the need for alert marketing, plus the greater attention focused on marketing research and better technical assistance to buyers.

Their reasons appear valid. The over-all average of selling and distribution costs does not appear to be out of proportion.

Disturbing, however, is the wide disparity in marketing costs, even among companies selling similar products. Where selling and distribution costs are extremely low, we wonder whether an adequate marketing job is being done.

Where selling costs are unusually high, we suspect an examination of the "whys" may be in order. Perhaps your salesmen are chasing too many smokestacks. Perhaps they are spending too much time on nonprofitable accounts. Perhaps they are neglecting to follow through on the good ones. Perhaps more attention should be paid to mechanized selling and less to personal selling. Perhaps sales management needs an overhaul.

A dollar saved in reducing marketing inefficiency is just as big as one saved in cutting production costs. How do your selling costs compare with those of your competitors?

Walter J. Campbell

MANAGING EDITOR

DATA SHEET NO. 4

INLAND

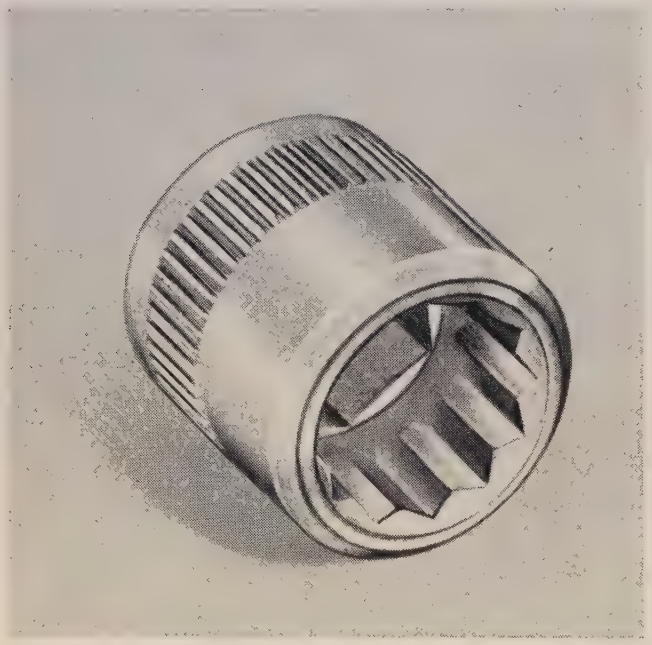
facts about

LEDLOY*

*Patented Tradename of Inland Steel Company, leaders in development of Leaded Steels.

TOOL MANUFACTURER CUTS COSTS 12% WITH LEDLOY

Ledloy combines superior machinability plus all advantages of open hearth steel



This socket head wrench is now coming off the manufacturer's production line 52% faster than it used to! Cost per part is 12% less! The difference is Ledloy.

Nothing was sacrificed to get these big savings, because Ledloy has all the fine mechanical properties of high-quality open hearth steel. How is it that a steel can combine both strength and the ultimate in free-machining properties?

The reason lies in Inland's patented process of dispersing an extremely small amount of lead—about ¼ of 1%—so uniformly through the steel that it can't be seen even when magnified 500 times. It is this uniform dispersal of lead that holds the real secret of Ledloy's amazing machinability.

In documenting actual case histories of Ledloy's performance in the shop, Inland metallurgists have found a number of reasons why these leaded steels cut production costs:

1. Faster machining. On many jobs, Ledloy can be machined up to 45% faster than B-1113.

2. Longer tool life. The fine lead particles in Ledloy lower the steel's friction component, actually lubricate the cutting tool. Also, Ledloy chips break into shorter lengths which quickly fall clear of the tool, again reducing friction.

3. Less machine down-time. Using Ledloy, there are fewer shut-downs for tool re-grinding. Machines work more, produce more parts per shift.

4. Fewer rejects. On precision parts, tolerances can be more closely controlled using Ledloy instead of conventional screw stocks.

5. Superior finish. The use of Ledloy may eliminate an extra step for polishing or buffing of finished parts.

If you make screw machine products or machined forgings, it will pay you to get all the facts about Inland Ledloy. Ask your cold-drawer or jobber about Ledloy today. Or write Inland Steel Company for an interesting new booklet, "Properties of Inland Ledloy Steels."

world's most machinable steel!

LEDLOY

INLAND

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

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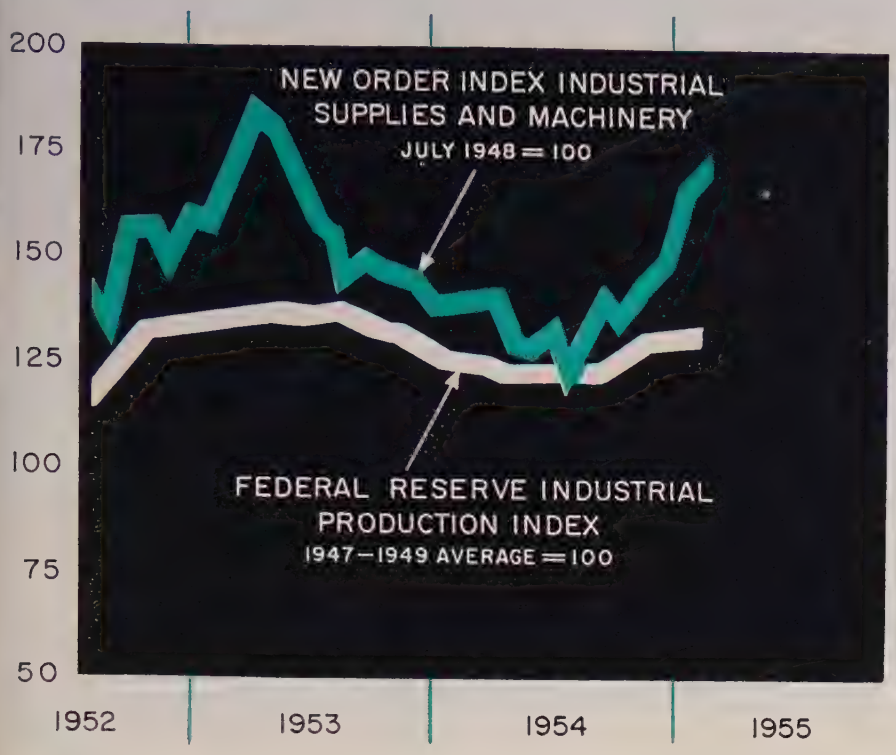


Business Chart Lines To Stay High

That's what makers and distributors of machinery and supplies for industry think. But orders aren't dropping into their laps. They're working for them

BUSINESS is good, and it's going to stay that way.

There's no doubt it among men who make and distribute machinery, supplies and equipment to industry. You could sense that at their Triple Industrial Supply Convention in Cleveland last week. Convening were the American Supply & Machinery Manufacturers' Association Inc., the National Industrial Distributors' Association and the Southern Industrial Distributors' Association.

Charting the Course—From their reports it's probable that the new order index (see chart above) of the American Supply & Machinery Manufacturers' Association will show a further climb for March and possibly April, too. It climbed for the fourth consecutive month in February and reached its highest point in 22 months. The February level was 175.1 per cent of the July, 1948, average. The value of orders received during February was more than 10 per cent above that of January. Historically, the indicator anticipates swings in the FRB production index.

Many of the manufacturers are seeing the same thing as the steel industry: There can be a high rate of business without a shooting war. (The steel industry's output is just a hair below the record set during the Korean war.) At SKF Industries Inc., Philadelphia (maker of ball bearings, roller bearings, pillow blocks and steel balls), business is better than it was during wartime, says D. W. McAllen, manager of distributor sales.

You Have To Work—While all of the companies represented at the convention didn't have business so strong as Mr. McAllen's, their reports were decidedly on the good side. But you must work for orders.

Indicative of the keenness of competition was the attention given to selling at the convention. The national and the southern distributors groups got together to hear a discussion of "Why Salesmen Fail," by Elton E. Hey, industrial sales manager, Union Hardware & Metal Co., Los Angeles. Carl O. Hedner, hoist sales manager, Yale & Towne Mfg. Co., Philadelphia, told distributors if they want to retain their status as "the hardware store for industry" they will have to demonstrate "the courage to take on new lines of products." The 2500 distributors in this country did just a little under $3.5 billion worth of business last year, Mr. Hedner pointed out.

Keen Price Competition—One of the reasons you have to work now for orders, even though plenty of business is available, is the keenness of price competition. Bert Morris of Persingers Inc., a distributor with headquarters in Charleston, W. Va., cited conveyor belting. "You count yourself lucky if you make more than 5-per-cent profit on that item," Mr. Morris confided.

While many of the manufacturers commented about the price softness, there was at least one step toward a firming. Makers of twist drills are raising their prices 20 per cent the first week in May. The drill producers were reminding their distributors that twist drill prices were reduced 15 per cent last year when business was dull. The producers also were pointing out that their prices have not risen so much percentagewise since 1940 as many other industrial goods. Opposition to the price increase was absent.

Why Business Is Good—Why is the industrial supply business good? SKF's Mr. McAllen says demand is good from all the industrial groups it serves. A. Barr Comstock Jr., general manager of sales, Pittsburgh Screw & Bolt Corp., Pittsburgh, reports that most of its customers—even railroads—are doing better.

Wire rope producers like American Chain & Cable Co. Inc., New York, and John A. Roebling's Sons Corp., Trenton, N. J., are experiencing a seasonal fillip from the construction and strip mining industries, in addition to an upturn from those of a less seasonal nature like industrial plants.

People like Philip C. Satterth-

waite, vice president and sales engineer, Cogsdill Twist Drill Co., Detroit, are enjoying good business from the automobile industry and are optimistic for the rest of the year.

Convention Calendar — Next year, the Triple Industrial Supply Convention will be held at Atlantic City, N. J., in May.

New president of the supply and machinery association is Clarence B. Noelting, vice president and sales manager, Faultless Caster Corp., Evansville, Ind. New president of the national distributors' group is C. E. Gollwitzer, Pratt-Gilbert Hardware Co., Phoenix, Ariz.; and new president of the southern association is Paul J. Stine, president, Harry P. Leu Inc., Orlando, Fla.

Ford Expands

A new line of cars or automotive products is seen possible as the result of the re-formation of a special products division by Ford Motor Co. A division of the same name was transformed into the Continental Division last fall. Continental, a new luxury car, will make its debut later in the year.

Ford made no comment on the new division, but noted that the unit would be a part of the automotive operations section of the company. This would give it responsibility for manufacturing and selling its own automotive product line.

Included in the reorganization is the establishment of separate divisions for Lincoln and Mercury. F. C. Reith will be vice president for Mercury, Ben D. Mills for Lincoln.

Aluminum Used in Kaiser Mill

Aluminum will play a top role in the construction of Kaiser Aluminum & Chemical Corp.'s new sheet and foil mill being built near Ravenswood, W. Va. The major building contract was awarded to Darrin & Armstrong Inc., Detroit. Work covered includes construction of a 358,000-sq-ft main structure (except for the previously let steel frame work).

Aluminum will be used for exterior and interior siding, panels, doors, stairways, flashings, piping and insulation.

New look in crawler tractors testifies that . . .

In Union There Is Strength

WHAT HAPPENS to the smaller company bought out by an industrial giant?

Eighteen months ago Euclid Road Machinery Co., Cleveland, was absorbed by General Motors Corp. Last week it was announced that the union has been blessed with issue, a superpowerful tractor (the CT-12) with independent motors and drives for each track (see above).

Feeling's Mutual—The marriage has been to the benefit of both parties. GM has expanded into the construction field. It is in process of moving the facilities of its Electro Motive Division from its Clinton road plant in Cleveland to La Grange, Ill. The Cleveland plant is being retooled for the CT-12 tractor and a line of scrapers. The consolidation will be completed by year end, bringing substantial operating economies.

GM's production know - how helped in getting the CT-12s out so fast. Stylewise, too, GM engineers are responsible for face lifting the prototype to its present functional sleekness.

Background — Though long on engineering talent, Euclid Road's fast postwar growth had left it short on expansion capital by 1953. Says R. Q. Armington, then president of Euclid Road and now general manager of GM's Euclid Division: "We wanted to round out our rubber-tired earth-mover line to stay abreast of competition. The $500-million crawler market was the best bet, and the merger gave us financial backing."

Some 100 CT-12s will be made this year. The first six production models are coming off the line just in time to get in on the ground floor of the expected road construction boom, and are slated for turnpike work. Stripped, they weigh in at 58,000 lb and have drawbar pulls of about 70,000 lb.

Outlook—The company has an order backlog of 100 units. Next year, production is expected to reach 500. With presently planned facilities, the goal is four a day by 1957.

Sales and Revenues

(in millions)

	1954	1953
General Motors	$9,824	$10,028
*Standard Oil, N. J.	5,805	5,630
**American Telephone	4,785	4,417
†A & P	3,989	3,756
U. S. Steel	3,251	3,861
‡Sears, Roebuck	2,965	2,982
General Electric	2,959	3,128
§Swift & Co.	2,511	2,597
Chrysler	2,072	3,348
§Armour	2,056	2,089
Safeway Stores	1,814	1,752
Gulf Oil	1,705	1,641
Du Pont	1,688	1,750
**Standard Oil, Ind.	1,660	1,709
Bethlehem Steel	1,657	2,082
Westinghouse Elec.	1,631	1,594
Socony Vacuum	1,609	1,607
Texas Co.	1,574	1,559
Western Electric	1,526	1,508
Shell Oil	1,312	1,270
National Dairy	1,210	1,232
Standard Oil, Calif.	1,113	1,080
Kroger	1,109	1,059
J. C. Penney	1,107	1,109
Goodyear	1,090	1,210
American Tobacco	1,069	1,088
Sinclair Oil	1,021	935
Boeing	1,003	918

*Restated to include affiliated companies. **Gross revenues. †Fiscal year Feb. 28. ‡Fiscal year Jan. 31. §Fiscal year Oct. 31.

GM Leads Sales in 1954

AN EXCLUSIVE GROUP—American corporations with gross sales of $1 billion or more—had 28 members in 1954. There were 32 companies with sales over $1 billion in 1953, 30 in 1952 and 27 in 1951.

Top leaders were General Motors Corp. with sales of $9824 million, Standard Oil Co. of New Jersey with $5805 million and American Telephone & Telegraph with revenues of $4785 million. U. S. Steel Corp., fourth last year, dropped to fifth as Great Atlantic & Pacific Tea Co. moved into fourth. Ford Motor Co., included among companies with large assets, does not publish its sales totals.

The general decline in business caused six concerns to fall from the $1-billion class in 1954. Two newcomers, Sinclair Refining Co. and Boeing Airplane Co., partially offset the loss. Dropping from the list were International Harvester Co., Humble Oil & Refining Co., Union Carbide & Carbon Corp., Firestone Tire & Rubber Co., Republic Steel Corp. and the Pennsylvania Railroad.

Hoover Hits Disposal Policy

The Hoover Commission is sharply criticizing government handling of its surplus property disposal.

"For the next several years, huge quantities of supplies approaching an annual rate of $2 billion in acquisition cost, will be purged from government warehouses," a report states.

As a vital part of an effective disposal and inventory control program, the commission recommends that the federal catalog (to identify property owned by the government) be completed as soon as possible.

Committee members admit that the disposal problem is complex. Assets amounting to some $155 billion belong to the U. S.

Steel Earnings Outrun Sales

FIRST-QUARTER steel company operations are running a close second to record performances.

Companies report that sales are moving toward 1953's Korean levels. Net incomes are among the best ever, owing in part to the expiration of the excess profits tax, in part to economies effected by new production equipment.

Cases—"This," remarks a Republic Steel Co. spokesman, "has been one of our best-ever first quarters." Net earnings are up 61 per cent over 1954 levels—$18 million against $11 million. Republic's sales ($263,273,372) were up some 23 per cent over last year's, though still about 10 per cent under 1953 performance.

Of the smaller companies, Pittsburgh Steel Co. enjoyed sales of $37 million versus $28 million last year. It also managed to get its profit picture into the black. Last year, the expense of starting up new equipment resulted in a loss of about $200,000. President Avery C. Adams says that first-quarter net income this year totaled almost $1 million, although new equipment is not operating at capacity.

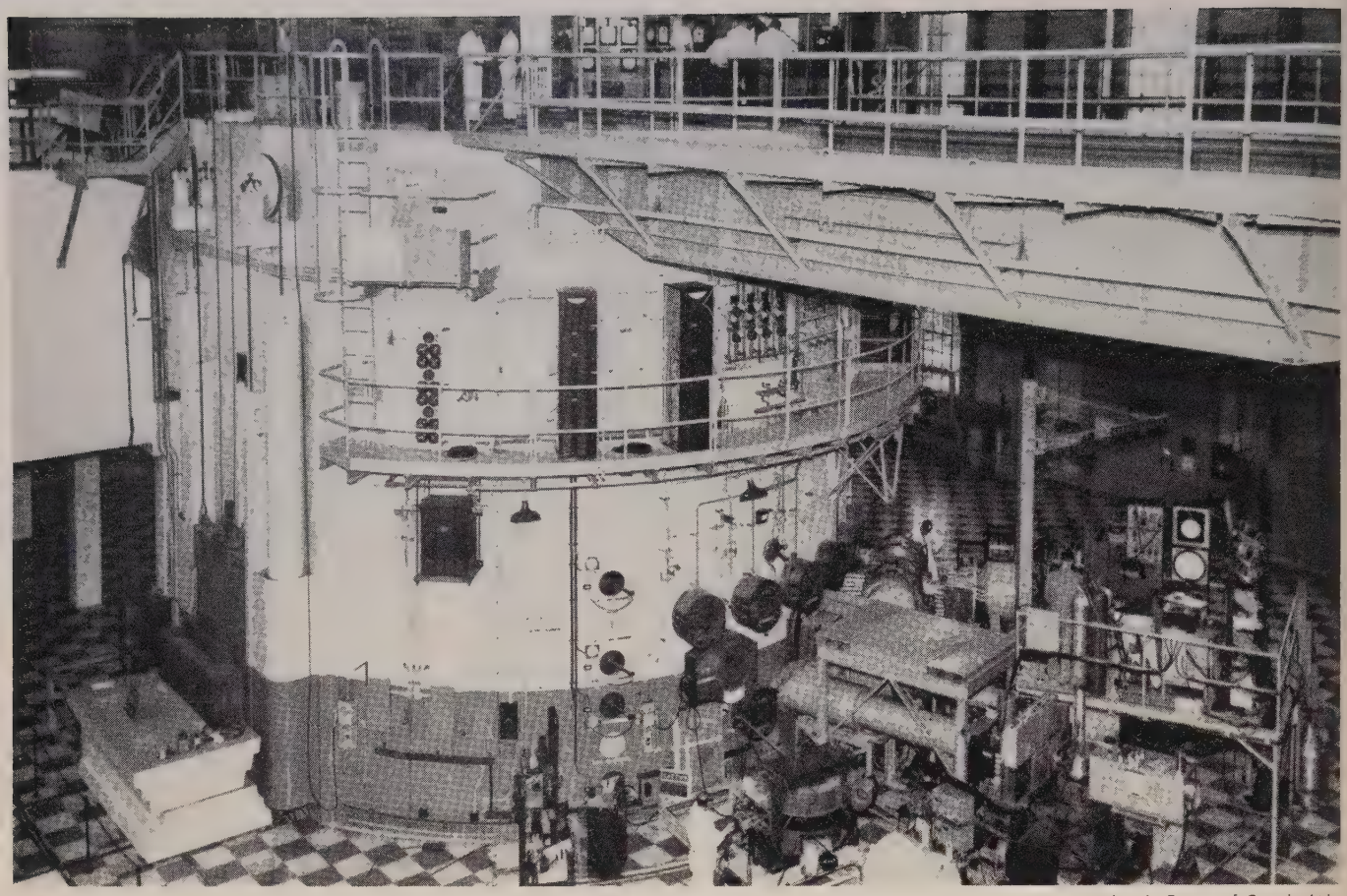
Reasons — Steel companies should be doing well. The national production of goods and services boomed to a new record of $369 billion in the first quarter. Chicago steel mills have been operating at better than capacity most of the year. Elsewhere, though production has not quite broken all-time records, it has been coming closer week by week.

Outlook — Allegheny Ludlum Steel Corp. reports that sales gains have been well distributed over its product line, and that the order backlog shows that the second quarter will be another high-production period. Says Pittsburgh Steel Co.: "Capacity operations can be maintained through the third quarter."

Sales and Income of Selected Steel Producers

	Net Sales 1st Quarter* 1955	1954	Net Income 1st Quarter 1955	1954
Republic Steel Corp.	$263,273,372	$214,469,708	$18,192,265	$11,079,012
Allegheny Ludlum Steel Corp.	53,657,226	45,614,000	2,410,906	1,063,450
Granite City Steel Co.	25,650,448	16,482,859	2,284,104	638,786
Pittsburgh Steel Co.	37,110,443	28,767,786	909,741	—199,150†
Crucible Steel Co.	50,943,010	43,440,380	2,248,896	529,926

*Includes other revenue in some cases †Net loss



Atomic Energy of Canada Ltd.

Atomic Energy Tries On Civilian Clothes

ATOMIC POWER will make quite a splash in metalworking's pocketbook—but not for about ten years. That's about how long it will take before the atom can compete costwise with electric power generated by the old standbys, coal and oil.

The reason is high capital costs. On paper, there are nuclear plants that can produce power cheaply enough to compete, but one or more hurdles must be jumped before any of those plants will be built.

Growth — Just the same, the atom means dollars in metalworking pockets. Take the radiation detection instrument industry. Ten years ago it didn't exist. By 1948, there were 45 companies in the field, employing 670 people and doing an estimated annual business of $4.2 million. In 1952 there were 80 companies employing 2410 people and splitting sales of $20 million. Business now is about $25 million annually and growing.

Some 1200 industrial firms are saving $100 million a year with radioisotopes for quality control. Thickness gages account for about one-third of the saving. They are put to over 300 uses in making products ranging from cellophane tape to steel sheet.

Savings—Carborundum Co. installed eight gages at $5000 each to control the application of adhesives and abrasives. Savings: $100,000 in the first year and a half.

Another one-third of the $100-million savings is in the use of radiographic inspection of castings and welds. To date, more than 53,000 shipments of radioisotopes have been made. In 1954 alone, 11,400 deliveries were made domestically and abroad. New uses continue to be found.

Potential—Last year's recipients included 492 new users, over half of them industrial firms. Currently, over half of all new applications for radioactive materials come from industry.

Fission products, radioactive by-products of the fission process, have potential as a source of large-scale, low-cost radiation. Another advantage is the different energy levels obtainable in comparison to present sources.

Attractions—Four major areas of activity are attracting private industry to the atom: Electric power derived from the heat of nuclear reaction, manufacture and industrial application of radioisotopes, nuclear and radiation instruments and uranium mining and processing (a $100-million-a-year business now).

More recently, interest is growing in the manufacture of reactor components. Westinghouse Electric Corp. has such a plant in operation, the first to be privately financed. Shipments of motor pumps for atomic power applications are growing; a broad line of atomic plant components eventually will be marketed.

Power — The company also is planning a $6.5-million reactor for

testing components under operating conditions.

Possibly some of those tested components will show up in the reactor Westinghouse is building near Pittsburgh for Duquesne Light Co. That plant probably will turn out the first large quantities of nuclear generated power. The future of the plant itself is uncertain because the power it produces will be expensive, probably more than double the all-U. S. average of around 7 cents per kilowatt-hour.

Lessons—But the main reason for building the Duquesne plant isn't to produce competitive power.

To be learned are industrial-scale lessons about: Fuel element fabrication, now a major cost factor in reactors using solid fuels; reprocessing used fuel (it may still contain more than 90 per cent of the valuable fissionable material); and waste disposal.

Knowledge will also be gained from study of the extreme operating conditions expected to be induced in the reactor by radiation, heat and corrosion.

Competitive — A nuclear plant having more promise of producing competitively priced electric power is projected by Consolidated Edison Co. of New York. The $55-million, 250,000-kilowatt unit will be expected to turn out electricity at about 9 mills per kilowatt-hour. That cost is within the range of the company's present system-wide cost, but engineers figure a new coal or oil burning plant of similar size could produce at 7.5 mills per kilowatt-hour.

Indicative of spreading knowledge in the atomic field is the Army Power Package Reactor (APPR). Ninety-four firms expressed interest in the project. Of those, 33 were judged qualified to design, build and assure successful operation of the reactor. Eighteen submitted fixed-price bids.

Size—American Locomotive Co., Schenectady, N. Y., got the contract on a $2,096,753 bid. The plant should produce 1200 kw of electricity and 2500 kw (equivalent) of heat for space heating. Transportability and ease of setup in the field will be features.

The potential size of the atomic energy industry can be gleaned from a quick glance at Atomic Energy Commission operations. Midwife to the industry, AEC has $13.2 billion in appropriations from Congress since its birth in 1946. Another $2.3 billion will be put up through June, 1957. AEC's plant investment, with most major projects out of the way, is about $6.2 billion, greater than U.S. Steel Corp. and General Motors Corp. combined.

Consumer—Costs incurred for new plant and equipment in fiscal 1954 alone were over $1.2 billion—a new peak for the program. During that period, AEC construction amounted to about 3.5 per cent of the nation's total construction bill.

In a recent year, AEC used 50 per cent of the U.S. supply of stainless steel tubing, 7 per cent of the nickel, 5 per cent of the sulphur and 2 per cent of the electric power.

Contractors — Almost 150,000 persons make their living from AEC. Less than 6000 are directly employed; the rest work for contractors. General Electric Co. alone has 12,000 employees working directly on atomic energy activities. Goodyear Tire & Rubber Co. has a staff of 2500 trained in nuclear physics, electronics and special operating procedures for the government plant it operates.

If the civilian atomic industry grows like its government counterpart, a vast new metalworking market is opening up.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, Steel, 1213 W. Third St., Cleveland 13, O.*

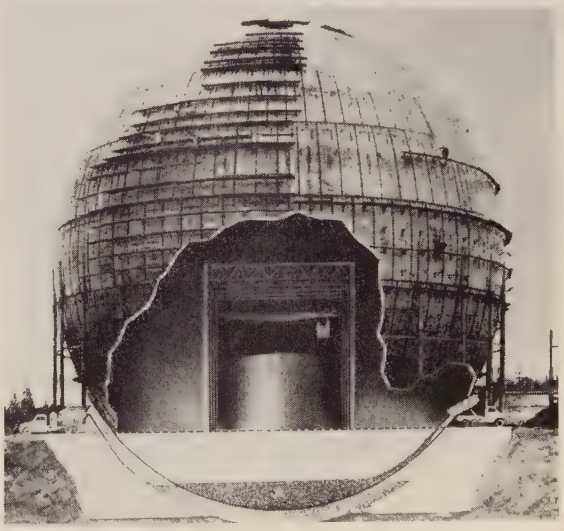
Atomic Vs. Conventional Power Plant

What do they cost (estimated for 100,000 kw)

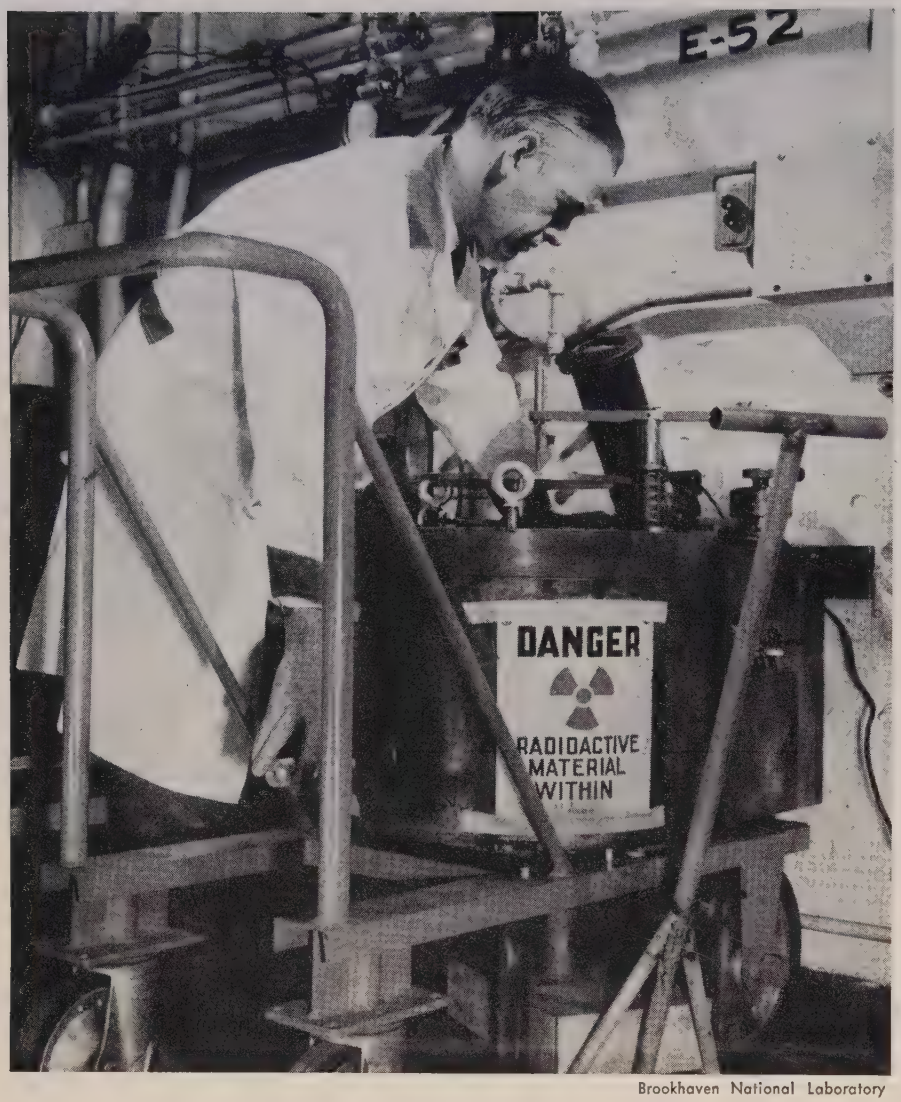
Component	Atomic	Conventional
Reactor	$10,000,000	.....
Furnaces	.....	$2,800,000
Boilers	1,400,000	1,200,000
Turbogenerators	5,000,000	5,000,000
Accessory Equipment	5,100,000	4,000,000
Buildings & Land	4,000,000	4,000,000
Total	$25,500,000	$17,000,000

How Atomic Power Industry Will Grow

	1955	1965	1970	1975	1980
Of total installed capacity (million kw)	108	220	270	320	360
This per cent will be atomic	0	1	7	23	37
Producing this many million kw	0	2	18	72	134
This per cent of new installations will be atomic	0	2	20	60	70



A 20-story steel sphere encloses test model of one of AEC's submarine reactors. The 3850-ton ball is supported around its middle by 26 steel columns. Rust Engineering Co., Pittsburgh, poured 28,000 tons of crushed limestone inside for ballast and floor space and 3900 cu yd of concrete outside for the foundation after the sphere was erected



Brookhaven National Laboratory

Private industry gets the go-ahead sign . . .

AEC Will License Atom

PROPOSED regulations for licensing private industry to build and operate atomic reactors were issued by the Atomic Energy Commission. Rules will be made final in 30 days—after the public has had an opportunity to submit suggestions.

Lewis L. Strauss, AEC chairman, says regulations open the way for research and development or commercial activities. License applications may be filed any time.

Licensing—Facilities include all reactors, gaseous diffusion and other isotope plants, chemical processing and fuel element fabrication plants. In each case, the attorney general must determine if the proposed plant violates antitrust laws.

Atom plants producing electricity are subject to the same regulatory agencies as utilities. The AEC will notify the proper agencies (federal, state or local) of all proposals.

AEC Rules—To get a license, an applicant: 1. Must be reliable. 2. Qualified by training and experience to use atomic material safely. 3. His equipment and facilities must be adequate to use fissionable material safely. 4. Use of the material must be authorized by the Atomic Energy Act.

Licensees will be responsible for loss, consumption, contamination or damage to nuclear material. The material will be "loaned" by AEC.

Before a company receives restricted data of any classification, it must submit a written statement of procedures for the safeguarding of restricted data and the security education of employees. The AEC is retaining the "need to know" test for the disclosure of restricted data.

Controls Aid Automation

Westinghouse develops control system featuring reliability and long life

ANOTHER STRIDE in automation's progress is Cypak, Westinghouse Electric Co.'s new electrical control system.

Cypak static switching circuits replace bulky relay systems. Their basic components are special magnetic amplifiers and transistors.

The director systems have been tested in the operation of complex machinery for the selective delivery and removal of ingots from a soaking pit, a skip-hoist director which permits the automatic charging of a blast furnace according to a program selected by the operator and a control for an automatic welder.

Other uses include the control of a fully automatic, six-story elevator, a supervisory control system for remote operation of electrical power systems, a relatively simple punch press control and a much more complicated spiral milling machine.

Applications—John K. Hodnette, Westinghouse vice president, says: "The place where the extreme reliability of director systems will be most welcome is in the control of complex operations involving many different machines. Transfer machines, such as those used in the manufacture of engine blocks in the automotive industry, are basic examples of integrated systems which require reliable, coordinated control."

The more complex the control problem, the greater the danger of complete malfunctioning of the entire system because of a defective component. Of course, the cost of down time increases with the complexity of the system. Cypak is of particular value because it has no moving parts or filaments to burn out. Director systems can be built to perform 20 million cycles in a matter of hours and still show no signs of deterioration or wear.

Packaged Profit for Wagner

The company tells AMA conference how it wrapped up a four-part program to cut packaging costs and upgrade the identification of its products

IN A SPAN of two years, Wagner Electric Corp., St. Louis, was able to start saving on operating costs at a $400,000-a-year clip. Its secret: Improved handling of packaging materials.

Four Steps—Speaking before the American Management Association's packaging conference in Chicago last week, Elmer Kruse, Wagner's supervisor of packaging specifications, outlined his company's program this way:

1. A girl's job was made less monotonous. 2. The method of receiving containers from a supplier was changed. 3. An automatic packaging machine was purchased. 4. A new container was adopted for one of its products.

Formerly, a girl took containers from a paper bag and placed them on a conveyor. Analysis showed her job was not only monotonous but left her considerable idle time. Having her place the cans facing in the right direction for filling paved the way for a faster second operation—that of placing the cans on trays.

More Savings—Why not have the containers shipped in on trays and save an operation? The supplier agreed to the plan if Wagner would furnish the trays and pallets—a $6500 investment. Wagner's savings from the switch: $35,000 annually, plus time saved in unloading the truck and warehousing.

Study also showed that the company's machine which broke and folded cartons, dropped in parts and glued and sealed the cartons was not keeping pace with Wagner's needs. So it had a machine built which would:

1. Set up the cartons. 2. Print the part number on the carton. 3. Carry the carton to the point where the part could be dropped in. 4. Glue, seal and discharge the carton on the packing table. 5. Be adjustable to at least three different sizes. 6. Increase daily output.

Maximum output on the new machine is about 25,000 units per day with a crew of four. The old method produced 8000 daily with five people. Employees found that input effort is no greater with the new equipment, and Wagner officials report that the $18,000 investment will pay for itself in eight months!

The fourth step in the company's cost reduction program was to revamp its transformer package. Experience showed that its open-crate container was not dirtproof, some damage was possible and it was difficult to identify products.

Solution—Using fiber drums in which the company received many of its materials solved the dirt, damage and identification problems, but the plus factor was that nearly 75 cents per transformer was saved on packaging costs.

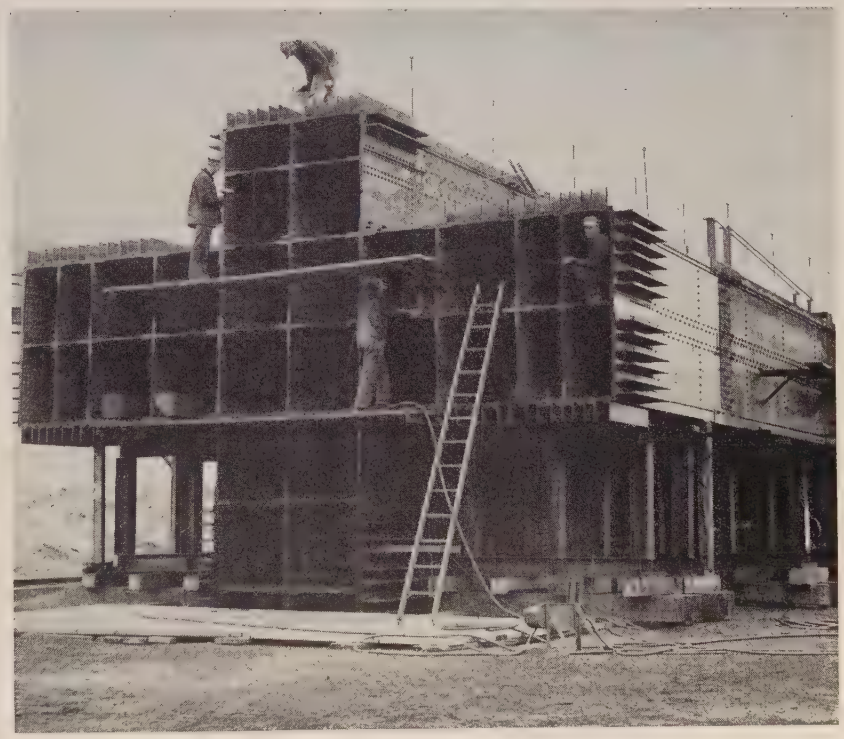
Wagner Electric formed a packaging committee in 1953, Mr. Kruse pointed out. It consists of representation from production, engineering, sales, sales promotion and advertising, cost and purchasing departments. Major changes must be approved by all members.

"Our cost reductions coincided with the organization of the committee," says Mr. Kruse.

Lubricating Engineers Convene

Experts attending the tenth annual meeting of the American Society of Lubricating Engineers in Chicago maintained that industry can save millions of dollars with controlled lubrication. They reasoned: The human element is minimized, and the improper application of lubricants is eliminated.

The society's new president is J. W. Hopkinson, Penn Petroleum Corp., Detroit. He succeeds John Boyd, Westinghouse Electric Corp., Pittsburgh.



Five-Mile Bridge in Fabrication Stage

American Bridge Division of U. S. Steel Corp. will be shipping sections of the Mackinac Straits bridge to Michigan by the end of April. Total construction cost will be about $80 million. Some 70,000 tons of steel will be used in fabricating and erecting the new bridge, which will be 26,195-ft over-all. It is a suspension type, with a center span of 3800 ft. Height at the center span will be 148 ft which will allow ocean-going ships to pass under when the St. Lawrence Seaway is completed. Erection of the steel superstructure will begin during the early summer. It is anticipated that the bridge, to accommodate four lanes of traffic when completed, will open Nov. 1, 1957. Some 66,000 tons of steel will be used

Progress Report on Mobilization

HOW IS THE U.S. meeting the threat of a "hot" war? Appearing before the Congressional Joint Defense Production Committee, Arthur S. Flemming, director of the Office of Defense Mobilization, gave ODM's progress report on the situation.

Components

The much discussed industrial component program is about to start. The Vance Committee has approved a plan to let General Services Administration buy $64 million in machine tools to reduce the shortage of capacity to produce turbines and turbine gears. No decision has been made on proposals to use borrowing authority to overcome an apparent shortage of capacity to produce steam boilers. Dr. Flemming wants Congress to O.K. using the revolving fund set up by the Defense Production Act to fill gaps in component capacity.

Elephant Tools

A survey of all known elephant tools is also under way. An initial report, covering 71 companies, shows that there is a stock of 867 elephant tools, one-quarter being less than ten years old, one-half less than 20 years old. Principal equipment-owning agencies of the government also are reporting similar information on tools of this type.

Machine Tools

About 87,000 machine tools (valued at $1.2 billion) have been delivered since the Machine Tool Program was inaugurated in October, 1951. Out of this total, all but 832 were purchased by private industry. Director Flemming reports that federal charges for leased equipment are in line with the interest being collected by commercial leasing firms. The American Machine Tool Distributors Association reports that the average charge is from 12 to 19 per cent. The government's rate, reduced to simple interest per annum, is 16.3 per cent on a five-year lease.

Railroads

"The ability of the railroad system to carry mobilization loads has been lessened . . ." states Dr. Flemming. In 1954, about 70,000 freight cars were scrapped. Only 28,000 new cars were delivered. An ODM Consultants Committee is studying this problem and will report within 60 days.

Future Plans

Stabilization planning is divided into two approaches: What must be done in case of attack and what are the long-term mobilization considerations of total war?

Attention now is being concentrated on: 1. Standards to be applied to wartime agricultural prices. 2. Business pricing standards. 3. Wage and salary stabilization. 4. Administrative and wage dispute considerations. 5. Rationing and rent stability programs. 6. Legislative problems. 7. Military goods pricing and exemptions.

Plans also are under way to formulate production and materials controls to meet situations involved in surprise attack, reorganization after attack, etc.

Antitrust Report

Congressional hearings on the controversial antitrust report will give a full airing to the dissents that peppered the document. At least three committees plan to make a study of the whole situation, including the findings by the Attorney General's National Committee to Study the Antitrust Law.

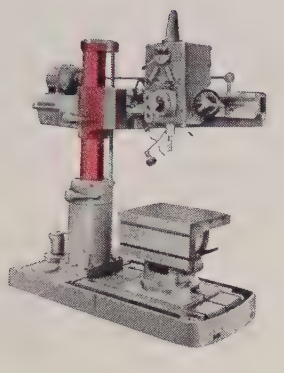
Meet George Peterson: New director of the Copper Division, Business & Defense Services Administration, his work is closely related to the production of copper wire and copper-base alloy products required for direct defense items.

Admiral Peterson comes to BDSA on loan from his position as assistant to the president, Simplex Wire & Cable Co.

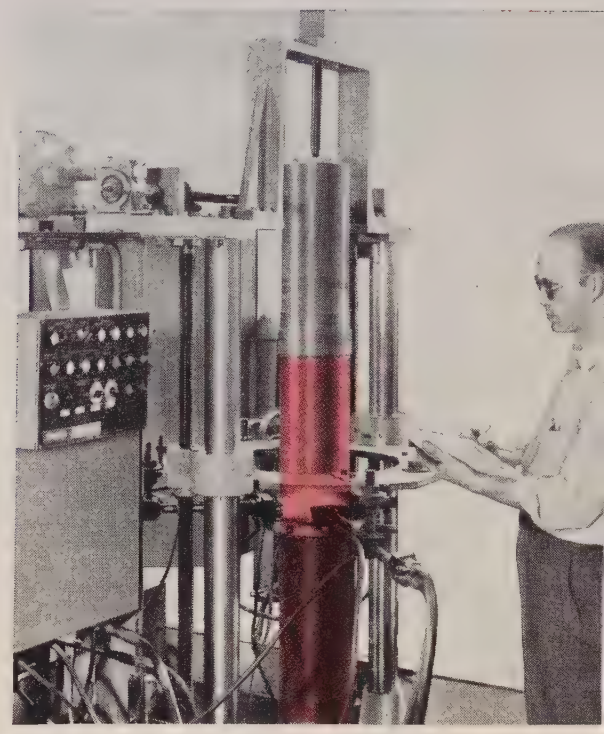
NO. 31 OF A SERIES

what's new?

flamatic-hardened radial column*



* CINCINNATI LATHE AND TOOL COMPANY'S NEW "HARDCLAD" RADIAL DRILL



Here's a Flamatic-hardened column that is designed to resist scoring and hold its accuracy substantially longer than conventional columns. This column, a new feature of the Cincinnati Lathe and Tool Company's radial, is a centrifugal casting of close-grained iron, surface-hardened on a special Cincinnati Flamatic machine which holds the piece vertically while the flame head assembly with integral water quench moves from bottom to end of flame hardened area.

If you make columns, rolls, or any cylindrical parts, check into Cincinnati Flamatic surface hardening. It may add years of accuracy and service to your products. And it may cost less—in initial investment and operating costs—than other hardening methods. Write for further information.

CINCINNATI flamatic

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

FAMOUS FIRSTS IN THE IRON & STEEL INDUSTRY

SAMUEL HIGLEY—AMERICA'S FIRST STEEL MAKER

The credit of producing the first steel in America goes to Samuel Higley, of Simsburg, Connecticut. In the Connecticut State Library there is a certificate signed by two blacksmiths . . . Phelps and Drake, stating that Higley took specially shaped wrought iron from them and later returned with the iron refined into steel. This certificate is dated May 7, 1728, but it has been established that Higley's first experiments bore fruit in or around 1725. Based on the testimony on this certificate Higley and his associate Dewey were awarded patent rights to run for ten years.

It is believed Higley made his steel by the cementation process. In this process charcoal was packed around wrought iron bars and the whole mass was heated in a closed furnace for a week or more. The longer the iron was heated, the more carbon it absorbed from the charcoal. This "blister-steel", or rather an iron core with a steel surface, was poor in quality by modern standards, but it was the beginning of one of America's greatest industries.

The J. E. Baker Company discovered years ago how to prepare better dolomite. The results of constant experimentation developed BAKER'S MAGDOLITE, the original dead-burned dolomite. Today BAKER'S MAGDOLITE delivers more uniform ingots with less defective production material. Try BAKER'S MAGDOLITE today. It is always 5 ways better: Composition, Preparation, Strength, Economy, Quality.

3-55

ANOTHER FAMOUS FIRST

JEBCO PRODUCTS SINCE 1889

BAKER'S MAGDOLITE

The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO

Inland's Holmberg: Simplicity His Byword

AN ORGANIZATION can remain dynamic only if its management has sufficient leeway to develop its potential abilities to help the company grow.

Company policy is an important factor in providing this opportunity for management development, says Clarence L. Holmberg. He speaks from experience.

Going Up—Now assistant to the vice president of planning and administration at Inland Steel Co., Mr. Holmberg has not only helped streamline his company's policies, but his personal record is one of rapid growth.

Starting with Inland in 1927, he came up through the ranks—from shipping department clerk to the purchasing department; from the industrial engineering office to the mill training program; then to sales and business procedures. Before his present assignment, he was general manager of sales.

Helping Tool—Policies and standard procedures, Mr. Holmberg points out, should be a tool for the individual management member. They should be readily usable to get the job done efficiently. They should invite voluntary use.

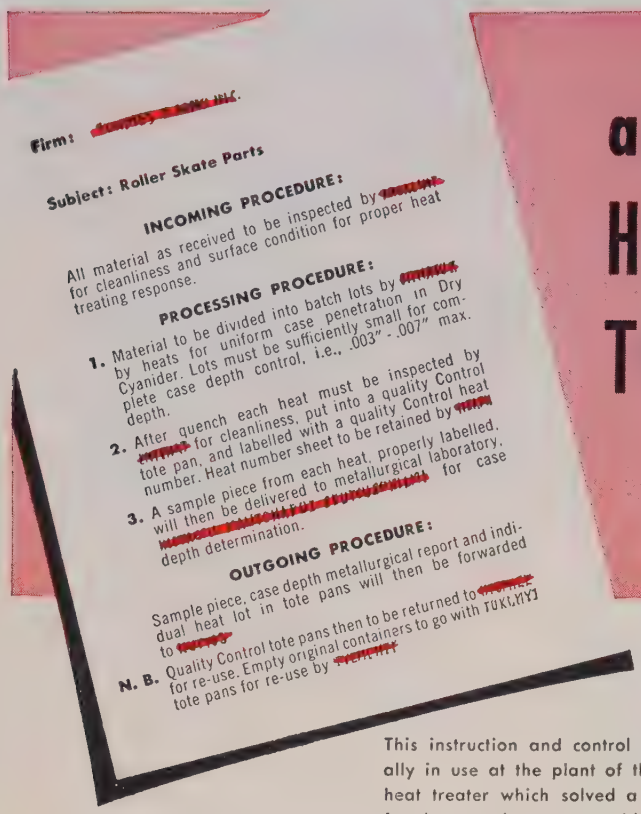
How's this achieved? By keeping written policies and procedures at a minimum, and by keeping those which must be written brief and clear. "In our company," says Mr. Holmberg, "we do not seek to cover all activities in written standards. We give attention to those which involve several organizational units which lend themselves to substantial improvement through written standards."

Written Confusion—Written policies and procedures are often complex and verbose, Mr. Holmberg emphasizes. The best written procedures are statements of general responsibilities, not limits on the individual's activities.

Two pitfalls to avoid: 1. Lack of compliance: This may indicate a basic weakness. The policy or procedure probably is not written understandably, or management may not fully appreciate the work load of the people affected. 2. Obsolescence: Policies and procedure must be kept current to enable a company to keep pace with changing conditions.

Another Benefit—Management members also have been able to introduce long-range planning projects. Three are under way. Inland is installing its third continuous galvanizing line; a new wide-flange-beam mill is scheduled to begin operations this fall; and work on a new 19-story office building—a project Mr. Holmberg is spending a lot of time on—will start late this year.

an example of HOW COMMERCIAL HEAT TREATING CAN HELP YOU



Firm: [redacted]

Subject: Roller Skate Parts

INCOMING PROCEDURE:

All material as received to be inspected by [redacted] for cleanliness and surface condition for proper heat treating response.

PROCESSING PROCEDURE:

1. Material to be divided into batch lots by [redacted] by heats for uniform case penetration in Dry Cyanider. Lots must be sufficiently small for complete case depth control, i.e., .003" - .007" max. depth.
2. After quench each heat must be inspected by [redacted] for cleanliness, put into a quality Control tote pan, and labelled with a quality Control heat number. Heat number sheet to be retained by [redacted]
3. A sample piece from each heat, properly labelled, will then be delivered to metallurgical laboratory, [redacted] for case depth determination.

OUTGOING PROCEDURE:

Sample piece, case depth metallurgical report and individual heat lot in tote pans will then be forwarded to [redacted]

N. B. Quality Control tote pans then to be returned to [redacted] for re-use. Empty original containers to go with [redacted] tote pans for re-use by [redacted]

This instruction and control sheet is actually in use at the plant of the commercial heat treater which solved a real problem for the manufacturer as told here.

Recently a manufacturer of roller skate parts encountered a great deal of difficulty in trying to find a source of heat treating for a particularly hard job. So serious was the problem that at one time consideration was given to installation of the necessary equipment at the manufacturer's plant. However, equipment would have cost over $20,000 plus the additional expense of labor, plant space, insurance, supplies, and above all, the metallurgical supervision required to control this intricate work properly.

The manufacturer turned to a local commercial heat treater to handle the work and even offered to install the required equipment. However, they were able to handle the job to the utmost satisfaction of the customer, using existing facilities.

The cyaniding operation involved required a case depth of 0.003" to 0.007". Samples of each batch processed are sent outside to a commercial metallurgical laboratory for inspection and testing. After OK, the parts and metallurgical report for each batch are shipped to the customer. The control sheet shown here is actually in use at the plant now doing the work and conveys some idea of the thoroughness to be expected from those commercial heat treating plants which are members of the Metal Treating Institute.

A reprint of the article, "Heat Treaters Cite Short Cuts to More Effective Purchasing" is available from each of the companies listed. This handy reference will prove of value when ordering heat treating.

THERE'S A HEAT TREATING SPECIALIST NEAR YOUR PLANT

Ace Metal Treating Corp.
Elizabeth, New Jersey

Anderson Steel Treating Co.
Detroit, Michigan

Benedict-Miller, Inc.
Lyndhurst, New Jersey

Bennett Heat Treating Co., Inc.
Newark 6, New Jersey

Commercial Metal Treating, Inc.
Bridgeport, Connecticut

Cook Heat Treating Co. of Texas
Houston 11, Texas

Dayton Forging & Heat Treating Co.
Dayton 3, Ohio

The Drever Company
Philadelphia 33, Pennsylvania

Greenman Steel Treating Company
Worcester 5, Massachusetts

Fred Heinzelman & Sons
New York 12, New York

Alfred Heller Heat Treating Co., Inc.
New York, New York

Hollywood Heat Treating Company
Los Angeles 38, California

L-R Heat Treating Company
Newark 5, New Jersey

Lakeside Steel Improvement Company
Cleveland 14, Ohio

Metallurgical, Inc.
Kansas City 8, Missouri

Metallurgical, Inc.
Minneapolis 14, Minnesota

Metlab Company
Philadelphia 18, Pennsylvania

Metro Heat Treat Corporation
New York 13, New York

New England Metallurgical Corp.
South Boston 27, Massachusetts

Paulo Products Company
St. Louis 10, Missouri

Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania

Queen City Steel Treating Co.
Cincinnati 25, Ohio

J. W. Rex Company
Lansdale, Pennsylvania

Stanley P. Rockwell Company
Hartford 5, Connecticut

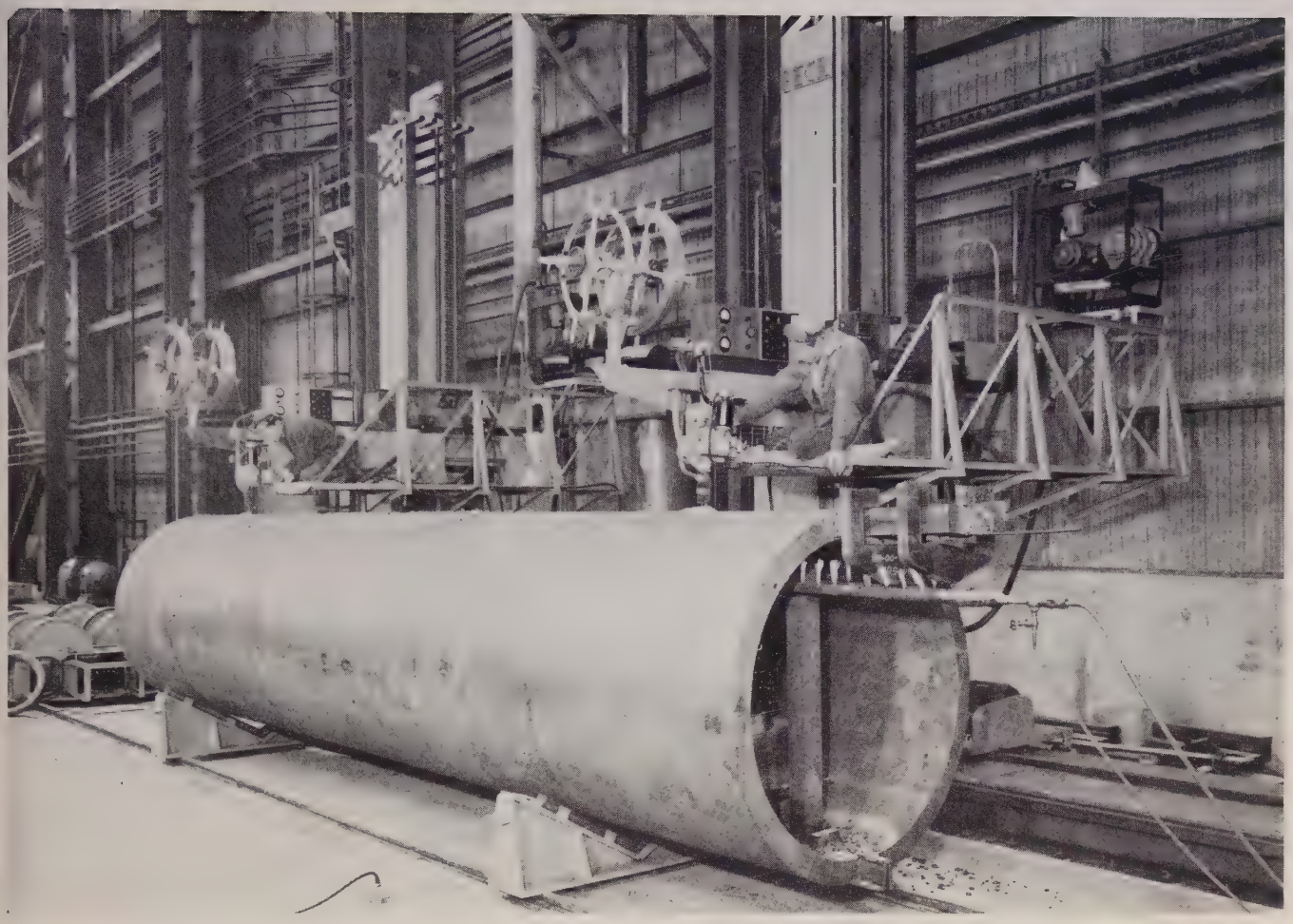
C. U. Scott & Son, Inc.
(Stainless Steels)
Rock Island, Illinois

Syracuse Heat Treating Corp.
Syracuse 3, New York

Winton Heat Treating Co.
Cleveland 16, Ohio

This advertisement sponsored by these Companies which are members of the Metal Treating Institute

MTI MASTER CRAFTSMEN METAL TREATING INSTITUTE



Cecil C. Peck Co.

Industrial Tailors: They Start with Ready-Mades

"YOU CAN'T BUY custom bodies at your Ford dealer. You can't buy custom welding equipment off the shelf.

"That's why we're in business," remarks W. A. Dewald, sales manager of Cecil C. Peck Co., Cleveland, designer and builder of welding tooling. "If you want high production with minimum labor cost, you often have to design machines for the specific parts you're going to weld."

Economics—Since their sales volume is built around a standard line, welding equipment makers find it economically impractical to spend time and effort engineering machinery to each application. It's left to Cecil C. Peck Co. and a few other companies like it to fill metalworking's need for special welding tools.

Mr. Dewald points out that the need is growing. "Accent on automation is bringing home to management the fact that special engineering is often the only way to get lower production costs. Since 1951, our sales have increased some 31 per cent. By the end of next year, we're hoping for another 40-per-cent gain."

Growth—Among the first in the field, Cecil C. Peck Co. was incorporated in 1946. At that time it had three employees. It now boasts 25 in the home office and maintains sales representatives in nine states from California to New York. The staff is heavy on welding design engineering and know-how.

The company produces no standard machines. Its nearest approach to standardization is a line of seam welders, and no two of them are exactly alike.

Co-operation—Although this job-shop approach doesn't fit the production philosophies of welding equipment makers, they can and do help in the sales job. Their field engineers often smell out likely leads, which Peck makes into sales by creating a machine to fit the need. Peck will design to use any standard make of welding head that the customer wants. The finished job represents anywhere from $2000 to $50,000 in production welding machinery.

For one big appliance maker, the company just has developed a series of machines to weld refrigerator compressor housings. The welding heads represent about $4000 of total machine cost. Peck's engineering contribution costs the buyer another $10,000, but he'll get production of about 120 units an hour with a small labor investment from each of the six machines he's taking.

"Our company is flourishing," says Mr. Dewald, "because it provides a service that saves money and that few others can handle."

for transportation equipment that stands up...

FLAT-ROLLED STEEL

produced by a specialist

The kids who roll down Oak Hill in a coaster wagon, and those of us who ride in the world's best automobiles, put a lot of faith in flat-rolled steel.

If you use flat-rolled steel in your products, rely on a specialist—Great Lakes Steel. Our entire organization is devoted to the business of making more and better flat-rolled steel for every application. Many manufacturers have found we have some unique qualifications to help them to improve products and reduce costs. We would like the opportunity to work with you on your problems.

Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

GREAT LAKES STEEL CORPORATION
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NATIONAL STEEL CORPORATION

PRODUCER OF NAX HIGH-TENSILE STEEL

SALES OFFICES IN CHICAGO, CLEVELAND, GRAND RAPIDS, INDIANAPOLIS, LANSING, NEW YORK AND PHILADELPHIA

Studebaker-Packard's Jim Nance counts on the . . .

Full Line: Key to Auto Success

STUDEBAKER-PACKARD CORP. has confidence in the future because no full-line auto producer has ever blooped.

The message is finding disciples now that James J. Nance, the corporation's president, announced that the new firm showed its first monthly profit in March—sales were up 71 per cent over the first quarter of 1954.

Viewpoint—There's nothing particularly unusual about a firm having confidence in the future. Each of the Little Three has it. But the interesting thing about this situation is that, like the three blind men in the fable, each is coming up with a different idea about the nature of the elephant.

To recapitulate briefly the two previous articles in this series of three, Kaiser-Willys no longer properly belongs in the Little Three category. The firm now prefers to be known as "world's largest producer of four-wheeled-drive vehicles," and, accordingly, is bowing out of the passenger car business. It reasons that chances for success are greatest by developing a special niche, such as that occupied by the jeep, not by attempting to beat the Big Three on their home grounds.

Lower Tooling — The inherent volume manufacturing and distribution economies of the larger firms are also recognized by American Motors Corp. It agrees with Kaiser-Willys that unusual features help sell vehicles. In producing its autos with unique attractions like reclining seats, the firm contends that passenger car manufacturing integration can give the lower volume producer an equal percentage of profit in competition with the Big Three. It has begun producing two makes of cars on facilities which formerly produced one. While this amounts to a reduction in unit capacity, the move gives AM two makes for its two sets of dealers. Tooling and manufacturing costs are strikingly below what they were when the two cars were made separately.

It should be pointed out quickly that each firm recognizes all the areas and considers them important. Attractive product features, adequate distribution and low unit cost are taken into consideration in each case. But in each instance, operations are guided by a certain primary consideration.

S-P's Full Line—In the case of Studebaker-Packard, the primary consideration is the full-line concept. Under this setup (natural in light of the merchandising background of Jim Nance), dealer and consumer points of view establish product type and structure. Where conditions are right from a sales volume standpoint, each dealer will be able to offer several cars, from the low-priced ones right on up to the top. Other dealers will sell various combinations of available models as indicated by market study. Already, about one-fourth of the firm's 4000 dealers handle a combination of Studebaker and Packard cars.

Another way to look at it: Every income level is a customer for one of the firm's products.

Same Game — But the way Studebaker-Packard looks at it, the only way to beat the Big Three is to play their game. Like American Motors, it feels manufacturing economies can be achieved to return a percentage of profit on sales equal to that of the Big

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Three without necessarily achieving their volume. However, Studebaker - Packard contends that broadening your marketing base first is the requisite step, rather than shrinking it in the interest of manufacturing economies.

The way Studebaker-Packard sees it, if you don't have a product that will sell and a line of products that will sustain a dealer organization, manufacturing economies don't count for much. Under the S-P view, the dealer and customer actually are the end of the production line. They must make way for more production or else plug up even the most efficient line.

Pick Your Level — The firm doesn't argue against manufacturing economy, however. Pointing out that a plant is efficient at its intended volume, the company thinks that this volume need not be astronomical. The new Utica, N. Y., engine plant of Packard's is notable for compacted automation on relatively low volume. This indicates a coming pattern of handling plants like blocks of capacity, adding more blocks as more capacity is required.

So far as product integration is concerned, it seems unlikely that the Studebaker and Packard lines will ever achieve anything like the Nash-Hudson solidarity. On the other hand, American Motors also has the Rambler which constitutes a second line. With Studebaker and Packard, interchangeability of chassis components and use of design features like the Torsion Level device seem to indicate sound areas of saving.

Office Integration—Administrative integration already is largely achieved, and probably will be superseded by a reverse trend of divisionalization once the firm is on its way. Study of opportunities for integration in marketing and engineering already is beginning to bear fruit. Plans for manufacturing integration are expected shortly.

Studebaker, of course, will be involved primarily in the facilities changes. Plants there are in much the same condition Packard occupied three years ago, with a main assembly plant of multistory construction hemmed in from further expansion just as was the Packard plant in Detroit.

Efficient—Up to date, however, are the Studebaker foundry, which was modernized after the end of World War II, and the Studebaker engine plant. Another pretty reasonable asset is the Studebaker press plant which supplies stampings like hoods, fenders and small components.

It seems probable that the Studebaker foundry will assume a large portion of the Packard work on the basis of the firm's build-it-yourself philosophy. The probability of a new body and assembly plant looms large. Also probable in 1956 models: Such components as torsion-level suspension and, possibly, the Packard engine and transmission in some Studebaker models.

Concept — Whatever happens, however, you may be sure it will be within the full-line concept. Expect the firm to be aggressive in manufacturing and engineering innovation and to move for manufacturing efficiency in any direction short of curtailing the number of market areas it covers.

Studebaker-Packard figures the full-line leads to success.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,528	574,215
March	955,014†	672,858
April		676,248
May		621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,884,989

Week Ended	1955	1954
Mar. 19	212,776	154,895
Mar. 26	217,347	149,586
Apr. 2	218,437	146,498
Apr. 9	207,089	152,086
Apr. 16	217,660†	148,559
Apr. 23	215,000*	157,710

Source: Ward's Automotive Reports.
†Preliminary. *Estimated by STEEL.

Testing the '55 Packard

It's hard to find a grubby urchin or grandpaw who doesn't know that the 1955 Packard has "level something-or-other." This may be symptomatic of a yearning for something different in contemporary automobilism or just a penalty of education through advertising. Most of a week behind the wheel of a Packard was spent finding out just what the torsion-level ride is.

The general answer: Torsion-level ride is good, but the conditions under which it becomes outstanding are seldom encountered in normal driving.

A quick distinction should be made between: 1. The interconnection of front and rear wheels by torsion bars to reduce pitch. 2. The use of torsion bars, which are electrically stressed, to compensate for loading. They are distinct developments, and their functions must be considered separately.

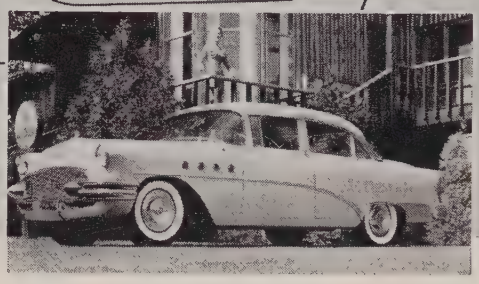
With regard to the reduction of pitch, our first acquaintance with this feature was at the Packard proving ground on a series of jumps perhaps a foot high. At 30 mph, other cars would crack heads on ceilings, while the Packard rode relatively smoothly. But in normal over-the-manhole driving, the ability of this suspension to cope with trying situations doesn't become any more useful than a jet during rush hour.

The Packard rides well, indeed, and probably deserves the crown against all comers in that department. But if you have less than 5000 miles on the present bus, don't throw it away or put a bullet through the crankcase.

The second half of the torsion-level deal is the levelizer, a supplementary torsion bar which functions like a variable helper spring. This could be added to any suspension and serves the important function of keeping the car level regardless of load. A softer spring can be used since no added reserve for load is required. The wheel travel provision is reduced and over-all height is lowered.

Until you get used to the leveling of the car which takes place on braking, hills, etc., the sensation is like having a second driver in the back seat.

WHY ZINC RATES FIRST IN DIE CASTING • NUMBER 1 OF A SERIES



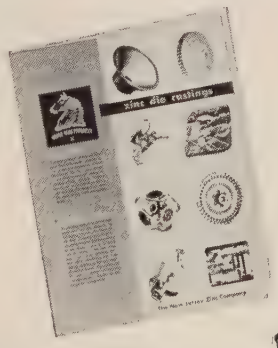
finishability as typified by BUICK

The distinctive beauty of the 1955 Buick front end bright-work bears impressive testimony to one of the principal reasons why ZINC is the most widely used die casting metal. Because they are ZINC, these die castings are *economically* finished in a handsome, durable chromium plate. No other die casting metal can match ZINC in providing both castability and plateability at low cost.

You have a complete choice of finishes when you specify ZINC die castings for the assembly of your products. Electroplating of ZINC die castings, especially with copper-nickel-chromium, is done on a very large scale. Or you may choose from a variety of organic coatings, such as enamels or lacquers, with assurance that a minimum of surface preparation will be required on the smooth as-cast parts. If a decorative treatment is not needed, but unusual exposure conditions prevail, ZINC die castings can be protected inexpensively by the application of Cronak*—a dichromate dip.

Our advertisments in this magazine in the months ahead will explain why and how ZINC die castings cut costs and improve the salability of a variety of products. Send for a copy of the new brochure shown here and contact any commercial die casting company regarding your particular production problems.

*For full details of the Cronak process write to The New Jersey Zinc Company, 160 Front Street, New York 38, N. Y.



Send for your copy

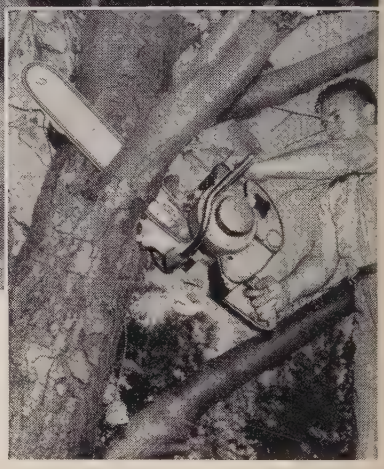
The New Jersey Zinc Company
160 Front St., New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

POWERFUL Homelite Model 17 Chain saw being assembled in Homelite factory at Port Chester, N.Y.



ONLY 22 LBS., Model 17 Homelite Chain saw delivers 3.5 hp — power to spare for felling trees 4 feet in diameter. Cuts up, down, left or right; is easily carried up trees.

Girl assembles chain saw 30% faster with RB&W SPIN-LOCK screws

SPIN-LOCKS hold tight where previous fasteners let go

Usually production men turn to RB&W SPIN-LOCK screws because they need a fastener that won't lose its grip.

But Homelite Corporation of Port Chester, N.Y. got a lot more value than they expected when they tried SPIN-LOCKS on their famous chain saws. Regular screws plus washers had loosened rapidly under vibration when the saws went to work.

SPIN-LOCK cured this problem, of course. Homelite reports: *"We've had no loosening of screws when the saws get out in the woods."* And, Homelite goes on, *"We also found through time studies that we saved an average of 30% in time required to insert and drive the screws — giving us lower labor cost and faster assembly time."* What's more, *"The average cost of* SPIN-LOCKS *and regular screws plus washers is just about the same."* Measure of Homelite's satisfaction: the new Model 17 saw uses *79* SPIN-LOCKS in *16* types and sizes.

Whether you want a fastening device with a bull-dog grip or a way to lower assembly time and costs, an RB&W SPIN-LOCK screw could be the answer. It's easy to find out — just write the nearest RB&W office. RUSSELL, BURDSALL & WARD Bolt and Nut Co., Port Chester, N.Y. 4.11

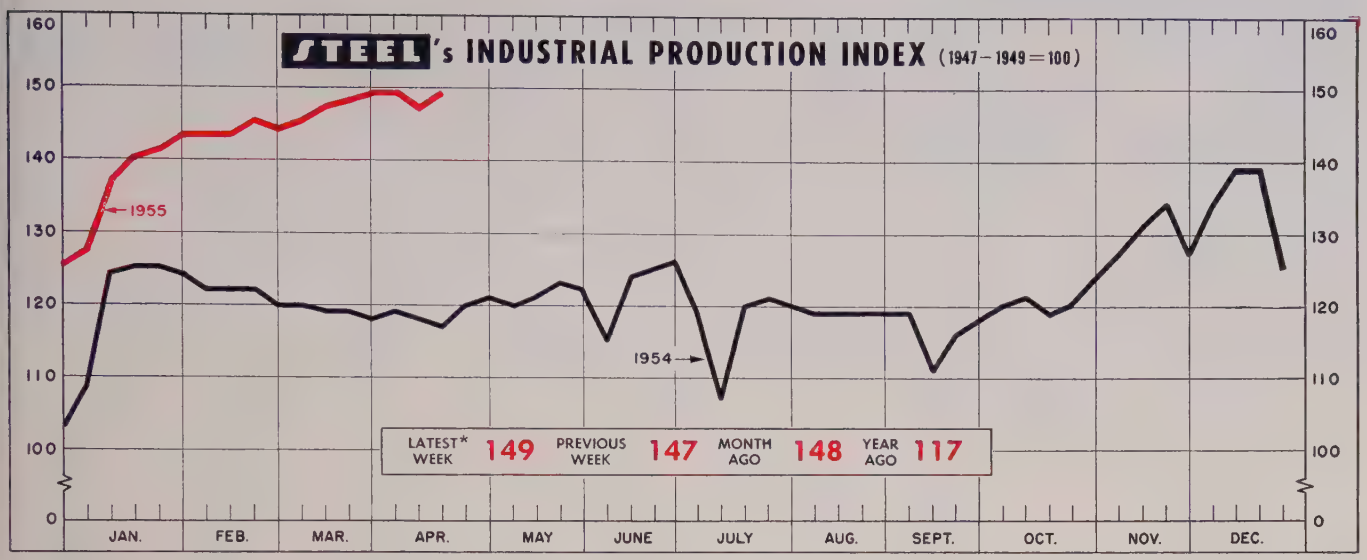
Check Sweet's Design File for RB&W SPIN-LOCK Catalog

RB&W Spin-lock

U. S. Pat. No. 2,253,241

The Tighter, Stronger, Surer Fastener!

110 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG



*Week ended Apr. 16. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Outlook for Second Quarter: One of the Best Ever

RECORD INDUSTRIAL OUTPUT is in sight for the second quarter. Signs point to: More buying for inventory. Rising capital outlays. Climbing employment. High consumer spending. Continuing high activity in steel and other metals. Seasonal or better gains in rail freight traffic. More records in construction and autos.

Darkest cloud in the sky is an auto strike, which would knock out chances for a record, though over-all business would still be good because of the spreading business pickup.

Inventories—Inventory building can be a big factor in how business goes. Up to now, relatively stable prices and generally good delivery have acted against sizable inventory growth. Buying has outpaced production gains, but inventory position in terms of days of supply hasn't changed much because of higher output. In a growing number of cases, stocks are below desired levels.

That, plus the definite likelihood of coming price increases to offset wage hikes, will stimulate buying. The second quarter is likely to show the first sizable increase in inventory since early 1953.

Band Wagon—Capital outlays will turn markedly upward in the second quarter after about a year and a half of slow decline. The upturn so far has been mostly in the commercial field; now manufacturers are climbing back on the wagon.

Estimates put capital spending by all industries at about a $27.5-billion annual rate for the final three quarters of this year. That may be conservative.

Increases—Continuing pickup in business will be following the trend that started last August. Since then, the Federal Reserve Board's seasonally adjusted, industrial-production index has risen from 123 (1947-1949=100) to 135 in March, only 2 points off the record 137 in May and July, 1953, peak of the Korean War boom.

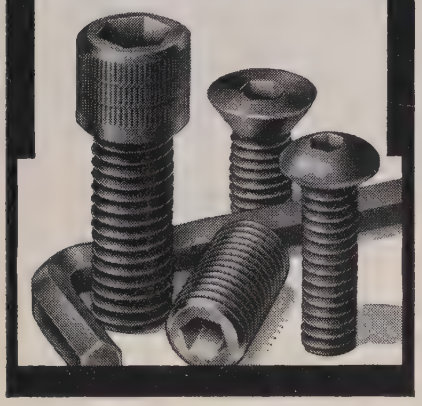
Metalworking is making an im-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,305	2,284	1,636
Electric Power Distributed (million kw-hr)	9,670[1]	9,633	8,345
Bitum. Coal Output (1000 tons)	8,195	7,350	6,768
Petroleum Production (daily avg—1000 bbl)	6,815[1]	6,811	6,589
Construction Volume (*ENR*—millions)	$272.7	$335.0	$306.5
Automobile, Truck Output (*Ward's*—units)	217,660	207,089	148,559
TRADE			
Freight Car Loadings (1000 cars)	666[1]	663	613
Business Failures (Dun & Bradstreet, no.)	217[1]	211	198
Currency in Circulation (millions)[3]	$29,841	$29,900	$29,793
Dept. Store Sales (changes from year ago)[3]	+8%	+11%	+16%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,926	$20,159	$17,299
Federal Gross Debt (billions)	$277.1	$277.1	$269.9
Bond Volume, NYSE (millions)	$18.4	$14.1	$14.9
Stocks Sales, NYSE (thousands of shares)	14,338	9,432	8,345
Loans and Investments (billions)[4]	$85.1	$83.5	$79.1
U. S. Govt. Obligations Held (billions)[4]	$34.4	$32.9	$31.5
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	237.1	237.1	214.2
All Commodities[7]	110.5	110.4	111.0
Commodities Other Than Farm & Foods[7]	115.7	115.7	114.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

THE
Number One Name
In Socket Screws & Keys
ALLEN

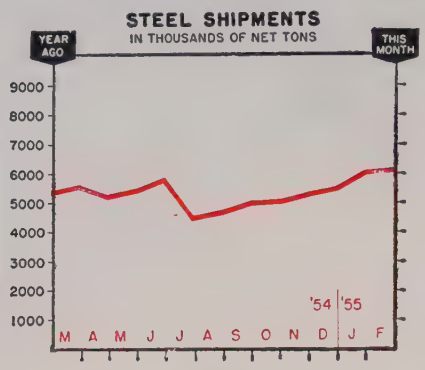


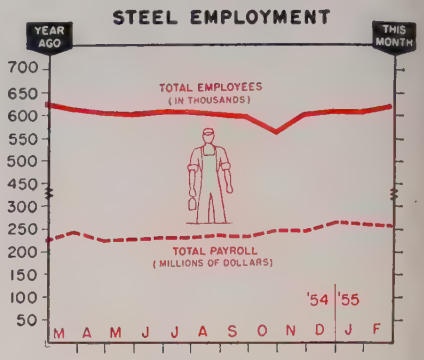
Don't take it for granted that any hex socket screw is an Allen. Your Allen Distributor *alone* can offer you

1. **ALLENPOINT SET SCREWS** with the new smaller point — proved by impartial laboratory tests to have greater locking power and vibration resistance, plus uniformly high shaft holding power, compared with conventional cup point screws and those with serrated or angled points.
2. **LEADER POINT CAP SCREWS,** for substantially reduced chance of thread injury or damage to threaded holes.
3. **ALLENOY STEEL** — with the strength and temper to permit the use of smaller sizes, and make button head and flat head screws practical despite necessarily shallower sockets.
4. **ALLEN PROGRESSIVE PRESSUR-FORMING,** producing contoured uncut fiber flow, from head to point. A process originated and perfected by Allen.

Be sure to get Allens in the black and silver striped box, sold only through leading Industrial Distributors. Write us for technical information.

THE BUSINESS TREND





	Net Tons		
	1955	1954	1953
Jan.	6,009,958	5,727,600	7,067,636
Feb.	6,119,900	5,364,978	6,533,227
Mar.	.....	5,583,690	7,436,919
Apr.	.....	5,287,972	7,162,460
May	.....	5,423,168	7,209,396
June	.....	5,887,488	6,950,059
July	.....	4,490,179	6,582,513
Aug.	.....	4,681,242	6,498,605
Sept.	.....	5,004,222	6,400,757
Oct.	.....	5,035,364	6,726,850
Nov.	.....	5,240,209	5,903,980
Dec.	.....	5,448,649	5,684,920

American Iron & Steel Institute.

	Employment in Thousands		Payroll in Millions	
	1955	1954	1955	1954
Jan.	605	645	$258.8	$251.3
Feb.	616	636	255.1	236.6
Mar.	...	621	.....	249.7
Apr.	...	609	.....	232.6
May	...	606	.....	234.4
June	...	609	.....	236.4
July	...	608	.....	232.8
Aug.	...	601	.....	238.8
Sept.	...	597	.....	234.6
Oct.	...	596	.....	244.7
Nov.	...	599	.....	247.7
Dec.	...	605	.....	262.2

American Iron & Steel Institute.

Charts Copyright 1955 STEEL.

pressive showing in that pickup. Output of durable goods is still rising, though still below 1953 because of military cutbacks. Nondurable goods and mineral output are back to earlier highs.

Metalworking Snaps Back . . .

Output of producer and consumer goods, metals and building materials continues to rise. Some industrial machinery lines and farm equipment are snapping back well from a slow 1954. Following model changeovers in February, truck production is on the upgrade.

Manufacturing employment continued upward in March and seasonally adjusted nonfarm employment was 48.7 million, 300,000 above a year ago. The workweek also was up—40.7 hours, compared with 39.5 last year.

Longer work time and higher wages pushed average weekly earnings to a new record of $75.30, up 6 per cent from a year ago.

Unemployment (3.2 million) was down seasonally from the February winter peak and about 500,000 below March, 1954. A further drop should come as warm weather activities get into high gear. But the trend will probably turn around again in late May and early June when large numbers of students begin seeking summer jobs.

Consumers: Still Spending . . .

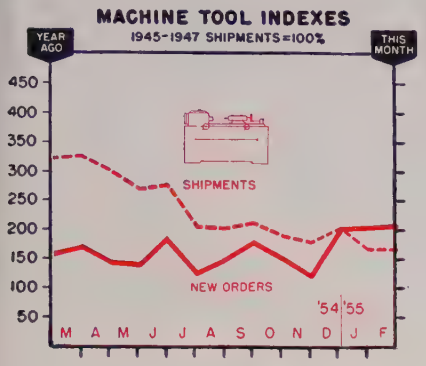
Rising employment and earnings are having a like effect on consumer spending—the main factor pushing gross national product in the first quarter to within 0.2 per cent of the all-time high ($369.2 billion annual rate) of mid-1953. This was in spite of a continued decline in government spending.

High consumer spending is spurring business, especially appliances, autos and construction.

Many appliances are being turned out at close to record rates. Production usually holds up fairly well from first to second quarter, often sprints in the third, and 1955 should show few, if any, exceptions. On the retail level, price competition is keen, but to compensate, turnover is high.

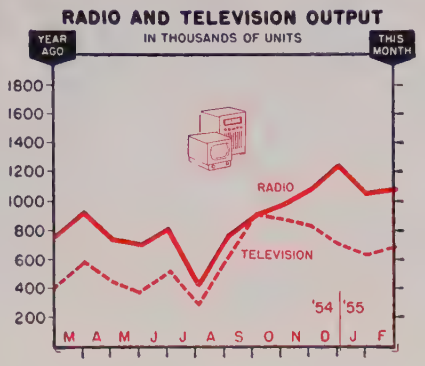
Autos Speed Ahead . . .

Sales of new and used cars in March exceeded those in any previous month. Dealers' stocks rose slightly but, in general, are still



	New Orders		Shipments	
	1955	1954	1955	1954
Jan.	203.0	173.5	167.3	319.4
Feb.	209.7*	159.8	168.2*	323.1
Mar.	....	169.6	....	327.2
Apr.	....	142.8	....	302.7
May	....	139.5	....	270.3
June	....	185.2	....	276.3
July	....	124.7	....	205.7
Aug.	....	147.9	....	203.7
Sept.	....	180.9	....	213.4
Oct.	....	148.9	....	191.0
Nov.	....	119.5	....	179.5
Dec.	....	202.9	....	203.4

*Preliminary.
National Machine Tool Builders' Assn.



	Radio		Television	
	1955	1954	1955	1954
Jan.	1,068	872	655	421
Feb.	1,090	769	703	427
Mar.	....	940	...	600
Apr.	....	745	...	458
May	....	722	...	396
June	....	838	...	544
July	....	438	...	307
Aug.	....	785	...	633
Sept.	....	932	...	948
Oct.	....	998	...	921
Nov.	....	1,099	...	859
Dec.	....	1,262	...	833
Total	....	10,400	...	7,347

Radio-Electronics-Television Mfrs. Assn.

under a month's supply, with the traditional big selling season just getting under way.

High auto sales to date helped push total retail sales 7 per cent above a year ago. Auto producers report sales gains, up to 100 per cent over last year in the case of one independent.

Continued high production going into the second quarter leads many observers to believe the industry will have shot its 1955 wad by June or July and that output will fall off to a trickle until new models come out. If that happens, or if there's an auto strike, the second quarter will be industry's best chance to topple the 1953 over-all "best quarter" record.

Building Sets New High . . .

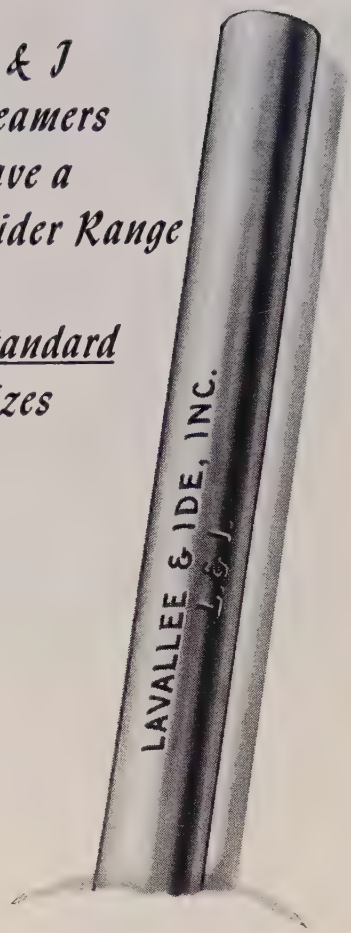
Construction contracts in March were highest for any one month except May, 1951, when large atomic energy awards were let. Housing is clipping off an annual rate of 1.4 million units. Total value of new construction is running along at a record seasonally adjusted rate of $41 billion, showing that housing, while it adds spice to the sauce, isn't the only ingredient.

Even if housing should taper off in the second half, total construction is likely to expand because of up paced industrial and commercial building, public works, highways and schools.

Trends Fore and Aft . . .

Volume of business received in recent months has increased in line with the general rise in machine tools, says Jerome A. Raterman, president, Monarch Machine Tool Co. . . . Admiral Corp.'s President D. Sirgusa predicts a 5-to-10-per-cent increase in sales this year despite an anticipated 50-per-cent drop in government business. Moreover, some of the nation's largest manufacturers are interested in Admiral-developed automation equipment; this field could provide the company with additional income. The first movement of color TV will begin in 1956, he says. . . . Net sales of metal fastening divisions of Atlas Tack Corp. for the first quarter of 1955 are about 20 per cent above the same 1953 period. . . . Business in the Pittsburgh area is at highest level since October, 1953, reports Bureau of Business Research, University of Pittsburgh. . . . Higher car loadings caused B & O to recall 325 car repairmen.

L & J Reamers have a Wider Range of Standard Sizes



Large Sizes
TO 1½"

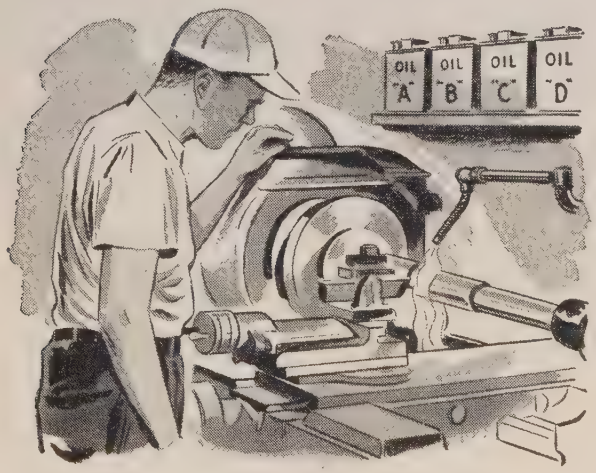
Small Sizes
TO .040

The Reamer Specialists
LAVALLEE & IDE, INC.
CHICOPEE, MASS.

How to Pick the Right Cutting Oil

WORD OF MOUTH?
It gives you the answer sometimes, but not many of your friends have the same cutting oil requirements and the same problems that you have. It's much surer to depend on specialists like Sun.

LABORATORY ANALYSIS?
Sure. But there's no formula for correlating the laboratory analysis with how well the cutting oil will work on your job. It takes years of field experience like Sun's to help you make the right choice.



ELABORATE SHOP TEST?
This will probably give you the answer. But it's expensive and interferes with production when you try to test all the oils available. Sun's experience can help keep your shop-testing to a minimum.

EXPERIENCE IS THE ANSWER.
And Sun has it. Its field representatives have probably come across problems similar to yours many times. If they haven't, its cutting oil specialists and metallurgical technicians are ready to help with your problem.

Soluble or straight, transparent or black, light or heavy duty — Sun makes the kind of cutting oil you need to handle your job at the lowest cost. For more information, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-4.

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RALPH C. HERDRICH
. . . Rolled Steel Products v.p.

FRED E. HARRELL
. . . heads Marquette Metal Products

M. NIELSEN
. . . Babcock & Wilcox exec. v.p.

Ralph C. Herdrich was elected vice president in charge of purchasing, **Rolled Steel Products Corp.**, Skokie, Ill. He was purchasing manager.

Jack N. Yetter was appointed sales manager, general products division, **Twin Disc Clutch Co.**, Racine, Wis. He succeeds **E. O. Billings**, retired, who continues in a consulting capacity. Mr. Yetter was sales promotion manager.

W. L. Wilkinson was appointed sales manager, **W. C. Twigg Industries Inc.**, Brazil, Ind. He was sales manager of Solar Aircraft Co., San Diego, Calif., for the last ten years.

Francis B. Makens was made general superintendent of the Chicago plant of **Joseph T. Ryerson & Son Inc.** Since 1953, he was operating superintendent.

John C. LaFave was made manager of jacketing sales, **Childers Mfg. Co.**, Houston.

H. C. Chobanian was made assistant purchasing agent, tractor products, **Allis-Chalmers Mfg. Co.**, Milwaukee.

Brainard Steel Division of Sharon Steel Corp. at Warren, O., appointed **Fred S. Seybert** chief product engineer and **C. Richard Bayman** chief plant engineer.

Fred E. Harrell, general manager, was elected president of **Marquette Metal Products Co.**, Cleveland, a subsidiary of Curtiss-Wright Corp. He succeeds **Herbert Gleitz**, founder of the firm, who retired. Mr. Harrell, associated with Reliance Electric & Engineering Co. for 30 years, recently resigned from that firm as vice president and director.

Thomas J. Joyce was made works manager, **Blaw - Knox Equipment Division**, Blaw-Knox Co., Pittsburgh. He was vice president and general manager of Tri-Lok Co. before that firm was acquired by Blaw-Knox in 1954.

Wilton O. English was made works manager, forging division, **Phoenix Mfg. Co.**, at Catasauqua, Pa. He was assistant general manager at Buckeye Forge Co., and before that was vice president of Lakeview Forge Co.

George H.Woodland fills the newly created post of general sales manager for the industrial divisions of **Chain Belt Co.**, Milwaukee.

Durwood J. Hedgecock, division staff engineer, was made chief engineer of **Reynolds Metals Co.**, Richmond, Va. **C. Davis Blackwelder**, a vice president, was appointed consulting engineer for the operations division at Richmond. He was chief engineer.

M. Nielsen, vice president of **Babcock & Wilcox Co.**, New York, was elected to the newly created post of executive vice president. He was in charge of the boiler division since January, 1954. **L. S. Wilcoxson**, vice president-research, succeeds Mr. Nielsen as vice president-boiler division. **Paul R. Grossman**, chief research engineer, was made director of research.

At **American Brake Shoe Co.**, New York, **John S. Hutchins**, president of Ramapo Ajax Division, was also named president of the National Bearing Division. **Thomas W. Pettus**, a vice president of American Brake Shoe Co. and formerly president of the National Bearing Division, was assigned to over-all railroad sales. Named executive vice president of National Bearing Division is **Charles M. Ruprecht**, president of Electro-Alloys Division. **Paul L. McCulloch Jr.**, sales manager of Electro-Alloys Division, succeeds Mr. Ruprecht as president.

Allan W. Larson was made sales manager, lighting division, **Westinghouse Electric Corp.**, Cleveland.

Simon Feigenbaum was named chief industrial engineer of **Jones & Laughlin Steel Corp.**, Pittsburgh. Former chief metallurgist at the Pittsburgh Works division, he is succeeded by **George G. Blean**. **W. H. Richey** was made

JOSEPH J. BECKA
. . . Barth plant superintendent

FRITZ C. HYDE JR.
. . . Standard Rolling Mills sales mgr.

JOSEPH F. HUTCHINSON
. . . Goodyear's automotive eng. mgr.

assistant chief metallurgist to replace Mr. Blean.

Joseph J. Becka was made plant superintendent of **Barth Corp.**, Cleveland. Now in charge of manufacturing operations of the Brookpark road plant, he was superintendent of the special machine division.

Wallace B. Leyda was made chief metallurgist at Copperweld Steel Co.'s **Ohio Seamless Tube Division**, Shelby, O. He held a similar position with Northern Indiana Brass Co.

William D. Gilder joined **Reed Roller Bit Co.**, Houston, as chief metallurgist. He was associated with Weatherhead Co. in a similar capacity.

George E. Little was appointed manager of the machine products sales division of **J. B. Beaird Co. Inc.**, Shreveport, La. He was plant manager for Fabricated Steel Products Inc.

H. T. Peeples succeeds **Oscar L. Maag**, retired, as lubrication engineer at **Timken Roller Bearing Co.**, Canton, O. **Wells E. Ellis** becomes assistant lubrication engineer.

Frank V. Terrell was made general superintendent, Christy Park Works, **National Tube Division**, U. S. Steel Corp., at McKeesport, Pa. He succeeds **John W. Hacker**, retired.

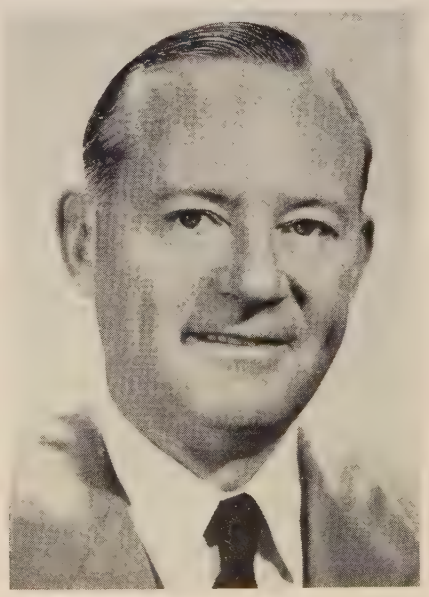
Fritz C. Hyde Jr. was made sales manager of the recently acquired **Standard Rolling Mills Division** of Revere Copper & Brass Inc. at Brooklyn, N. Y. He fills the position formerly held by the late **Leo F. Supple.**

Lester A. Edwards was made assistant sales manager of **Cincinnati Gear Co.**, Cincinnati.

Kenneth F. Leaman was elected vice president-manufacturing and **Harold R. Sennstrom** vice president in charge of product development at the **American Bosch Division** of American Bosch Arma Corp., Springfield, Mass.

Joseph F. Hutchinson was made manager, automotive engineering division, **Goodyear Tire & Rubber Co.**, Akron. He succeeds **J. C. Tuttle**, who was named consulting engineer for the division. Mr. Hutchinson was assistant general manager of the metal products division. **Gene C. Huffman** was appointed superintendent, metal products division.

Harold C. Medley was made chief engineer, conveyor division, **Jeffrey Mfg. Co.**, Columbus, O. He is replaced by **Arnie J. Kindig** as manager of conveying research and development. **Morton B. Curley** was made chief engineer, mining divi-



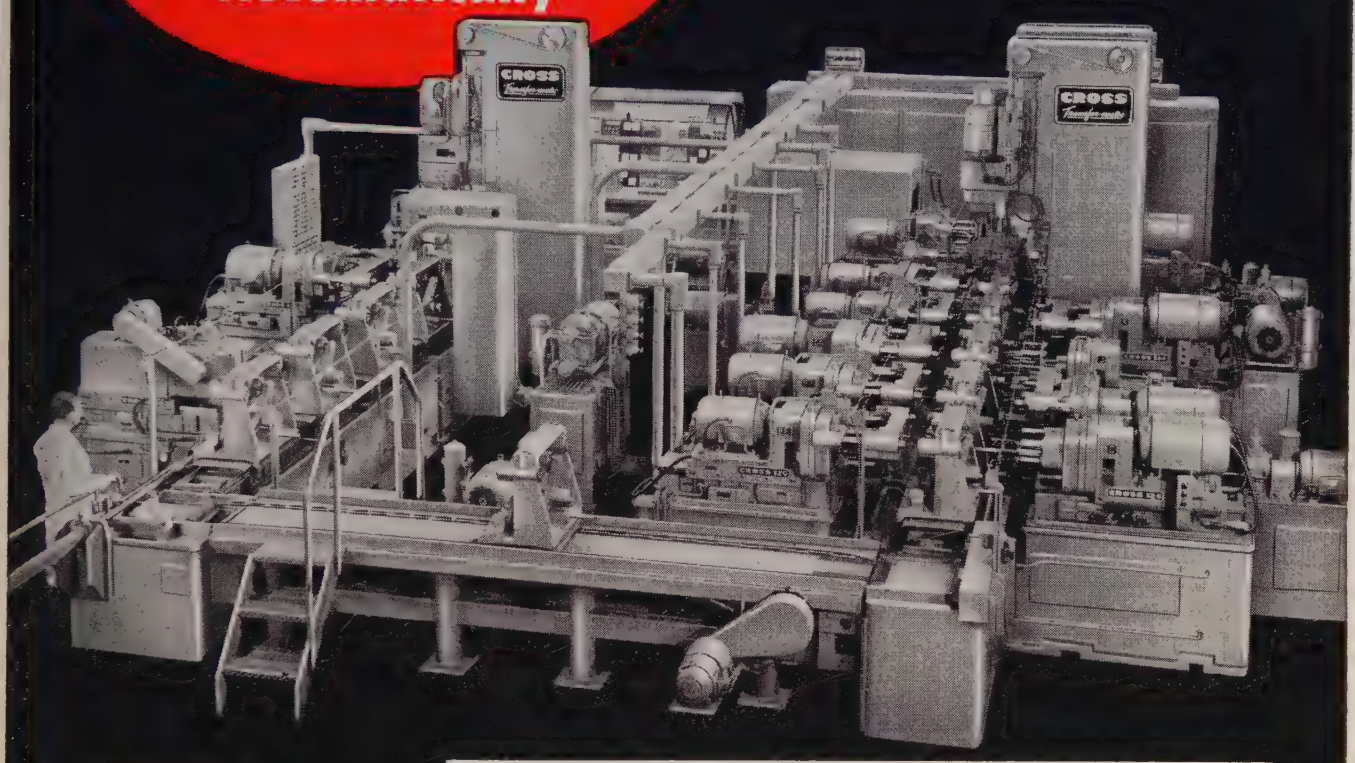
KENNETH F. LEAMAN

HAROLD R. SENNSTROM

. . . American Bosch Division vice presidents

Machines Flywheel Housings and Changes Set Up Automatically

Another Transfer-matic by Cross



- ☆ Completely machines (except for grinding three faces) flywheel housings for both standard and automatic transmissions.
- ★ Flexibility for scheduling because either part may be produced as required—set up changes and proper tools are selected automatically at each station.
- ★ 170 pieces at 100% efficiency.
- ★ 49 drilling, 22 chamfering, 4 reaming, 2 counterboring, 2 boring, 30 inspecting, and 30 tapping operations.
- ★ Palletized work holding fixtures with automatic transfer from station to station.
- ★ Hydraulic power wrench for clamping parts.
- ★ Other features: Complete interchangeability of all standard and special parts for easy maintenance; construction to J.I.C. standards; hardened and ground ways; hydraulic feed and rapid traverse; automatic lubrication.

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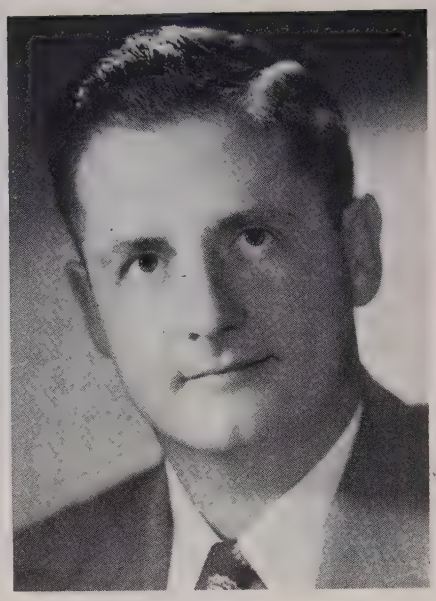
THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

FREDERIC W. THOMAS
. . . purchasing dir. for Vanadium



J. A. CROOKS
. . . sales post at Bethlehem Pacific

GEORGE A. HINCKLEY
. . . gen. sales mgr. at Automatic

sion. **John Beltz** fills the new post of chief consulting engineer to the mining division.

Frederic W. Thomas was made director of purchases for **Vanadium Corp. of America,** New York. Previously, he was purchasing director at Joy Mfg. Co., and general manager of purchases at Worthington Corp.

Victor H. Bradford was made sales manager, **Pratt & Letchworth Division,** Dayton Malleable Iron Co., Buffalo. He succeeds **Arthur M. Edwards,** now sales consultant.

Weldon Tool Co., Cleveland, elected **Walter C. Bergstrom** president to succeed his father, **Carl A. Bergstrom** who becomes chairman of the board. **Paul R. Hatch** was made executive vice president. He was formerly with Brown & Sharpe Mfg. Co. as vice president-sales.

J. A. Crooks was made assistant general manager of sales for **Bethlehem Pacific Coast Steel Corp.,** San Francisco. **C. D. Howe** was promoted from manager of bolt and nut sales to sales manager, San Francisco district.

Robert E. Crean was made manager of **Lincoln Engineering Co.'s** Philadelphia industrial branch sales office. He succeeds **M. C. Hazenfield,** retired.

Morris Bean & Co. named **Douglas E. Scott** sales manager for its aluminum foundry in Yellow Springs, O.; and **Edmund C. Turner** sales manager for its ductile iron foundry (Cedarville, O.) and for all tire molds.

John Wrench was made director of sales and service of **Continental Mfg. Corp.,** Culver City, Calif.

George A. Hinckley was made general sales manager, **Automatic Transportation Co.,** Chicago. For the last 18 months he served as sales manager for the Automatic line of rider-type trucks. He succeeds **Foster W. Lamb,** resigned.

Ernest S. Wellhofer succeeds **George C. Gregson,** retired, as plant manager of the wire rope divisions of **American Chain & Cable Co.** He takes over duties at the Wilkes-Barre, Pa., and Houston plants. **Charles H. Layton** replaces Mr. Wellhofer as chief wire rope engineer. For the last three months, Mr. Wellhofer has served as assistant plant manager.

E. Avery Williams Jr. was made manager of operations of **North American Refractories Co.,** Cleveland. He was assistant to the vice president-operations.

OBITUARIES . . .

Frank A. Hiter, 63, senior vice president of **Stewart-Warner Corp.,** Chicago, since 1944, and head of its Alemite and Instrument Division, died Apr. 9.

R. H. Schlottman, 66, controller, **Bethlehem Steel Corp.,** Bethlehem, Pa., and vice president-controller of Bethlehem Steel Co., died Apr. 11 while on vacation in Cuba.

R. E. Griffin, 58, executive assistant to the general manager, **Oldsmobile Division,** General Motors Corp., Lansing, Mich., died Apr. 10.

E. M. Weinfurtner, 65, president, **North American Refractories Co.,** Cleveland, died Apr. 15.

Charles L. Turner, 59, vice president-sales, **Buffalo Bolt Co.,** Buffalo, died Apr. 14.

John H. McElhinney, 67, vice president-operations, **Wheeling Steel Corp.,** Wheeling, W. Va., died Apr. 12.

L. H. Finkler, 53, assistant works manager of **American Motors Corp.'s** plant at Kenosha, Wis., died Apr. 8.

Charles E. Pfischner Sr., 52, president, **E. T. Lippert Saw Co.,** Millvale, Pa., died Apr. 4.

George G. Gries, 71, former vice president - sales at **Great Lakes Steel Corp.,** died Apr. 7 in Tucson, Ariz.

Fred Reese, metallurgist, warehouse division, **Atlantic Steel Co.,** Atlanta, died Apr. 6.

PAY-OFF PRICE ONLY 27 CENTS PER HOUR...

when you put this new 7½ hp No. 3 Model CE plain milling machine to work in your plant with...

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TOOL-LEASE PROGRAM

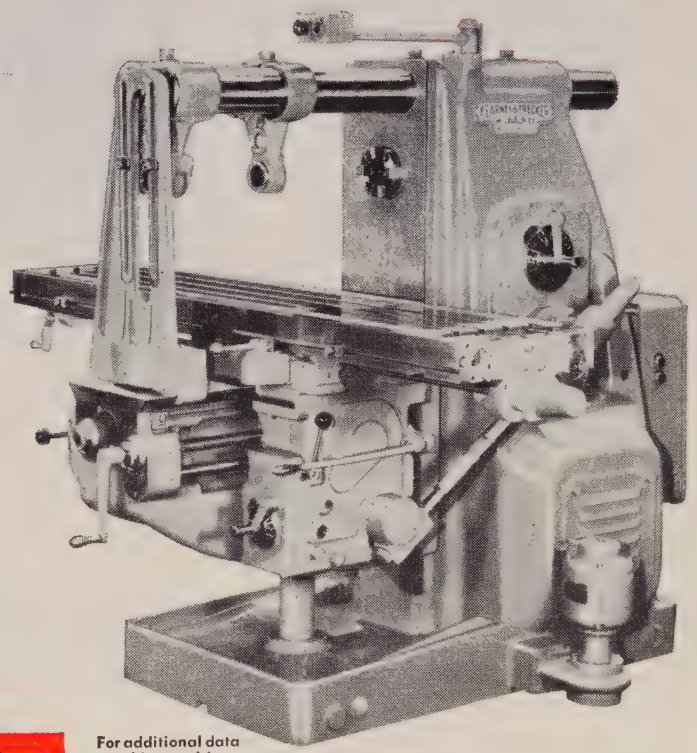
THE MACHINE TOOL SHOW CHICAGO, ILL. SEPT. 6-17, 1955 INTERNATIONAL AMPHITHEATRE — BOOTH NO. 508

IT's true! Under Tool-Lease you can lease this new 7½ hp No. 3 Model CE plain milling machine for *only 27 cents per hour*. This Model CE is Kearney & Trecker's answer to industry's need for a milling machine that combines *quality and low initial cost* with efficiency, ease and economy of operation.

Under Plan "A," one of three possible lease agreements, you make two semi-annual payments, totaling 25% of the machine's price during each of the first three years. And only 10% during each of the last four years.

What's more, under Tool-Lease you can rent any of over 250 different types and sizes of standard milling machines or precision boring machines. All are available under three basic plans, with varying options to continue or terminate the lease, or to purchase the equipment. If you require special machinery or heavy-duty CSM bed types, special agreements will be considered.

For complete information on Tool-Lease, see your Kearney & Trecker representative or mail coupon to Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.



For additional data on this machine, see our catalog in Sweet's.

MACHINE TOOL OBSOLESCENCE IS BECOMING CRITICAL! WHERE DO YOU STAND?

Fabricated Metal Products Industry — Includes machines for hand tools; hardware; oil burners; structural steel; boilers, sheet-metal, enameled, stamped and pressed metal products; powder metallurgy; wirework; screw-machine products; metal specialties, games, toys, jewelry, and sporting goods. Of the total 20,583 machines, 18% are over 20 years old and over 36% are 10 to 20 years old.

	Machines over 20 years old, which should definitely be replaced.	Machines 10-20 years old, which should probably be replaced.	Machines less than 10 years old.
3987 automatic and manufacturing type milling machines	14%	39%	47%
5143 vertical milling machines	10%	34%	56%
9573 knee type horizontal milling machines	25%	37%	38%
1009 bed type milling machines	14%	27%	59%
871 horizontal and vertical precision boring machines	2%	37%	61%

Figures adapted from 1953 American Machinist survey of Metalworking Industry.

KEARNEY & TRECKER CORP.
6784 W. National Ave., Milwaukee 14, Wis.

Please send me Bulletin TL-10A on Tool-Lease Program and booklet titled "Critical Picture of Creeping Obsolescence."

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Company.....

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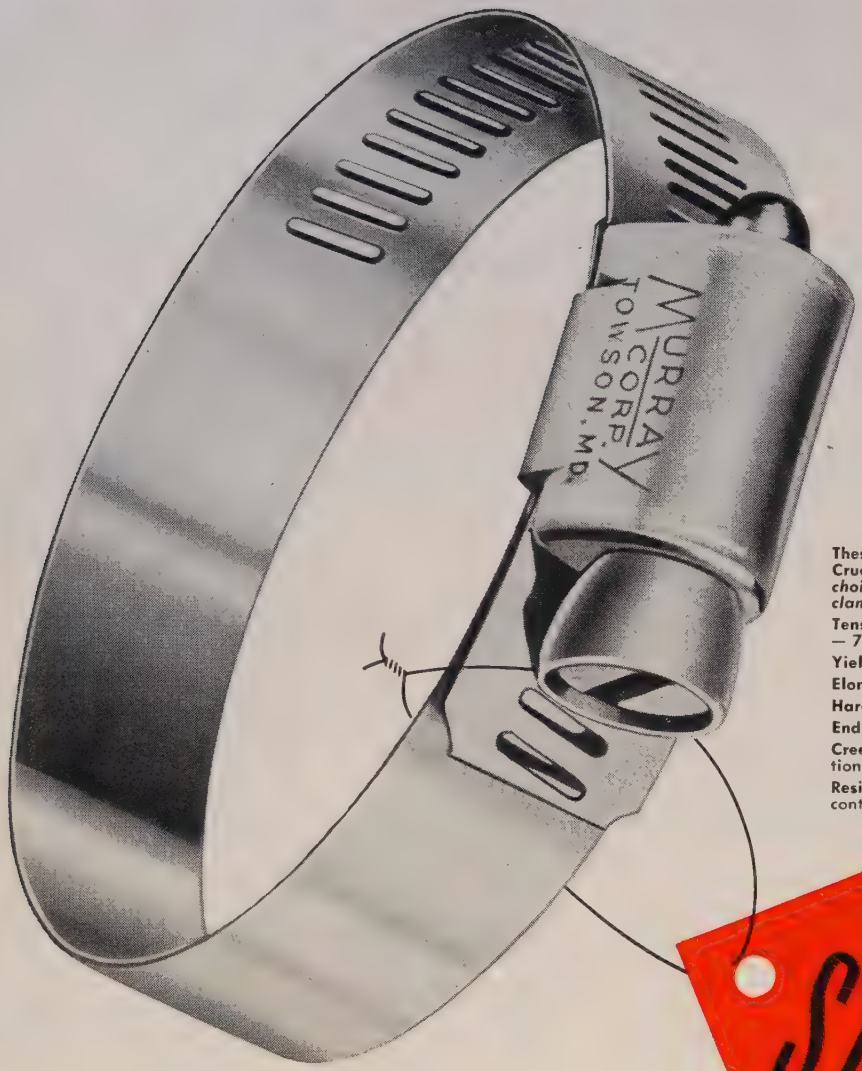


These typical properties show why Crucible 430 stainless was a good *choice for the Murray worm drive clamp.*

Tensile Strength — a. Room Temperature — 75,000 psi. b. At 1700F — 3500 psi

Yield Strength — 40,000 psi

Elongation — 30%

Hardness — 160 BHN

Endurance Limit — 40,000 psi

Creep Strength — Stress for 1% elongation in 10,000 hours at 1300F-1300 psi

Resistance to Scaling — Suitable for continuous service to 1600F.

the finest products wear a STAINLESS *label...*

When you label a product *stainless steel* it means lasting dependability . . . good looks . . . and resistance to wear or corrosion.

That's why the Murray Corporation, Towson, Maryland, chose Crucible stainless for the worm drive hose clamps shown above. These clamps need the high strength, wear and corrosion resistance that only *stainless steel* can provide.

Stainless has other advantages, too. Its high creep and fatigue strength . . . heat resistance . . . and excellent workability may be just what you're looking for.

At Crucible stainless steels are *prescription-made* by steelmen with over a half century of experience in *special purpose* steelmaking. They'll welcome the opportunity to help you make the most profitable use of stainless for your products. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Republic Offers New Item

Hurricane-resistant window, fabricated from chrome-iron alloys, has big sales potential

TREMENDOUS market potential is forecast for a new stainless steel product being mass-produced by the Truscon Steel Division of Republic Steel Corp., Cleveland. The division is fabricating a hurricane-resistant "window of tomorrow" from chrome-iron alloys.

First production will be 3200 windows for the Socony-Vacuum Oil Co. Inc. building, under construction in New York. They will be fabricated on assembly lines in Truscon's Youngstown plant where its many varieties of industrial, commercial and residential windows are produced.

Most dramatic of the window's features is its resistance to extreme weather conditions. Results of a hurricane test conducted by the University of Miami's housing research laboratory in Florida back the claim.

In the test, the window was subjected to a continuous blast of wind and water delivered by the propeller of a 1200-hp aircraft engine. Wind velocities were above 100 mph. The deluge of spray was equivalent to about a 4-in. rainfall, which was delivered directly at the window from close range for almost an hour. At the test's conclusion, examination revealed no trace of moisture on the indoors side of the window.

Pannier To Process Titanium

Pannier Metals Corp., Burlington, Vt., soon will start to process titanium. The concern will receive titanium in powder form and make alloy ingots.

McDowell Co. Expands

McDowell Co. Inc., Cleveland, acquired Dwight-Lloyd research facilities and all assets, patents and good will of Sintering Machinery Corp. Facilities will be operated as Dwight-Lloyd Division of McDowell.

Projects of the Dwight-Lloyd division underway include a 500,000-ton-per-year iron ore pellet pyrolizing plant at Negaunee, Mich., and a complete Dwight-Lloyd pilot plant for the new Monroeville laboratories of U. S. Steel Corp.

Forms Special Alloys Division

New Jersey Metals Co., Elizabeth, N. J., opened a Special Alloys Division. Production is under the direction of Rudolph Leuchtenberger, formerly production manager of Alloys & Products Inc., New York.

Wall Colmonoy Opens Branch

Wall Colmonoy Corp., Stainless Processing Division, Detroit, opened a branch in Montebello, Calif. The new plant will provide west coast manufacturers with contract brazing and heat treating facilities for stainless steel alloys and aircraft components.

Wheeling Builds Warehouse

Wheeling Corrugating Co., wholly owned subsidiary of Wheeling Steel Corp., Wheeling, W. Va., will erect a new warehouse in Minneapolis for the marketing of its products — including galvanized ware, galvanized sheets and roofings, conductor pipe, eave troughs and fittings, expanded metal lath, corner beads and building supplies. Corrugated culvert pipe will be manufactured at the warehouse. Neil H. Cheek is manager of the Minneapolis branch.

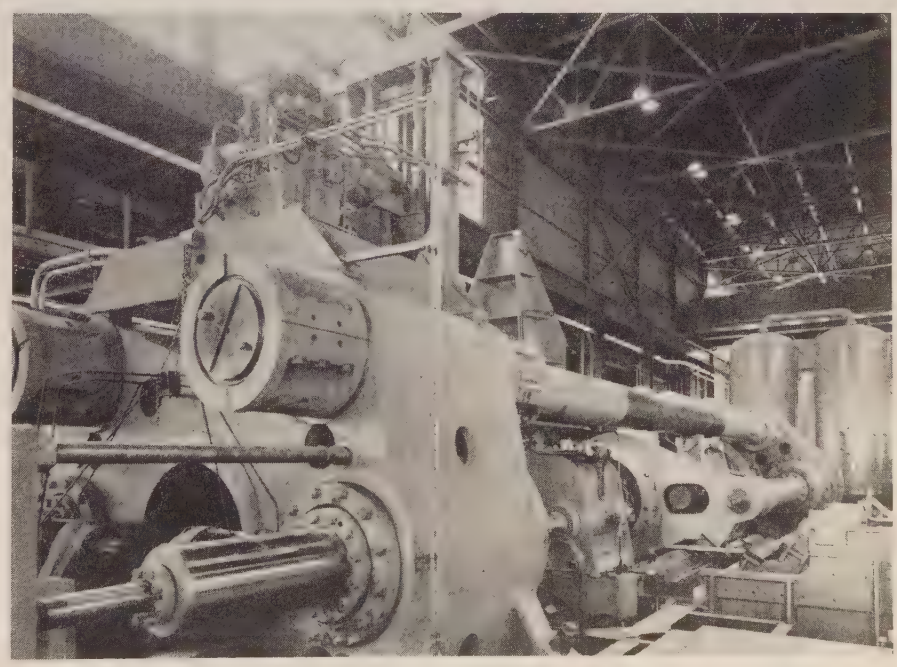
Burgess-Manning Adds Division

Penn Industrial Instrument Corp., Philadelphia, by corporate merger has become a division of Burgess-Manning Co., Libertyville, Ill., and Dallas. Penn instruments will continue to be manufactured at the Philadelphia plant. W. C. Bennett, formerly president of Penn, is vice president of Burgess-Manning and will manage the new division.

Glidden Buys Zapon

Glidden Co., Cleveland, purchased Zapon Industrial Finishes Division from Atlas Powder Co., Wilmington, Del. Glidden will operate the unit as Zapon Industrial Coatings Division.

Glidden will use the plant facilities of Zapon at Stamford, Conn., and North Chicago, Ill., to maintain service to customers. Plant opera-



Giant Extrusion Press Strengthens Country's Defense

This 12,000-ton, horizontal extrusion press has been installed at the Buffalo plant of Curtiss-Wright Corp.'s Metals Processing Division. With the ability to extrude steels, titanium and nonferrous alloys, it was installed jointly by the Air Force Air Materiel Command and Curtiss-Wright as part of the country's defense program. Metals Processing Division also makes forgings, steel castings and precision machined parts for industry and the military. The plant has produced more than 4-million turbojet blades for Curtiss-Wright engines

For the vital links in your

call in STANDARD conveyor

Up-to-the-minute conveyor planning between automatic machines and control points is essential to gain the full benefits of automation. Your needs in conveyors — ranging from engineered systems of power and gravity types to single units — can be met by Standard. Nearly 50 years of "package" conveyor application experience is available to you. Our engineers can choose from roller, belt, slat, chain, wheel, push-bar conveyors, spiral chutes and pneumatic tube systems, plus special portable types.

If you have plans of *any kind* — adding to present facilities or completely modernizing with a new conveyor system — write and tell us what you make or convey. Or call your Standard representative listed in your classified phone book. Send for General Catalog — address Dept. ST-45.

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General Offices: North St. Paul 9, Minnesota
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PNEUMATIC TUBE SYSTEMS

tions will be transferred later to Glidden facilities in those areas.

North & Judd Add Division

North & Judd Mfg. Co., New Britain, Conn., purchased the physical assets, inventories and patents of the E. A. Bessom Corp., Salem, Mass. Bessom manufactures sheet metal self-locking nuts. The facility will be known as the Con-Torq Division of North & Judd. Operations will be moved to New Britain.

Harry Alter Opens Branches

Harry Alter Co. Inc., Chicago, distributor of refrigeration parts and supplies, opened three branch offices: 122 Parkhouse street, Dallas; 7330 W. Madison, Forest Park, Ill.; 10407 S. Michigan avenue, Chicago.

Producto Machine Expands

Producto Machine Co., Bridgeport, Conn., manufacturer of die sets, die accessories and machine tools, is completing a $750,000 expansion and modernization program. Its foundry has undergone an extensive replacement program. Producto also has added several major machines to its production lines.

Borg-Warner Buys Brooks Firm

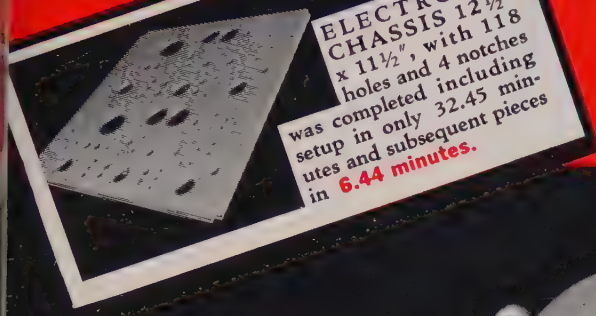
Ingersoll Kalamazoo (Mich.) Division of Borg-Warner Corp., Chicago, purchased Brooks Equipment & Mfg. Co., Knoxville, Tenn. Brooks, manufacturer of a materials handling device, will be operated as a subsidiary of Borg-Warner. President of the subsidiary is J. H. Ingersoll; vice president, R. F. Schutz. Officials plan to expand the Brooks operation.

Kaiser Builds Ohio Plant

Kaiser Aluminum & Chemical Corp., Chemicals Division, Oakland, Calif., bought land near Columbiana, O., for a $4-million basic refractory brick plant. It is scheduled to be completed and in operation by the end of the year. Production will be concentrated on basic brick for the steel, glass, cement and copper industries. It will be divided between the high magnesia

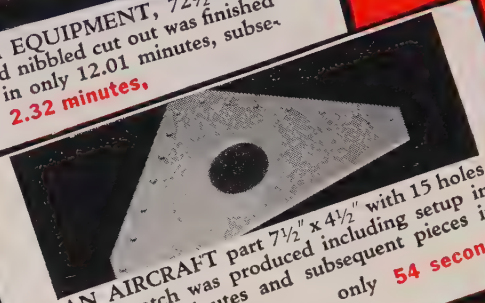
Check these AMAZING

WALES Fabricator Time Studies

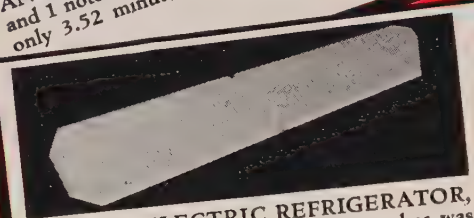


ELECTRONIC CHASSIS 12½" x 11½", with 118 holes and 4 notches was completed including setup in only 32.45 minutes and subsequent pieces in **6.44 minutes.**

A part of FARM EQUIPMENT, 72½" x 22" with 32 holes and nibbled cut out was finished including setup in only 12.01 minutes, subsequent pieces in **2.32 minutes.**



AN AIRCRAFT part 7½" x 4½" with 15 holes and 1 notch was produced including setup in only 3.52 minutes and subsequent pieces in only **54 seconds.**



Part of an ELECTRIC REFRIGERATOR, 39⅞" x 8½" with 10 holes and 4 notches was fabricated including setup in only 5.61 minutes and subsequent pieces in only **37 seconds.**

● How long would it take you to make a part similar to those shown above?

The difference between your production times and these typical astounding time studies is WALES Fabricators . . . *the only machine of its kind.*

Designed for rapid interchangeability of punch and die sizes for hole punching, notching and nibbling operations, Wales Fabricators permit working direct from blueprints or operation sheets . . . *no templates required.*

It's too big a story to tell here so write today for fully illustrated, functionally colored Catalog 10-AA.

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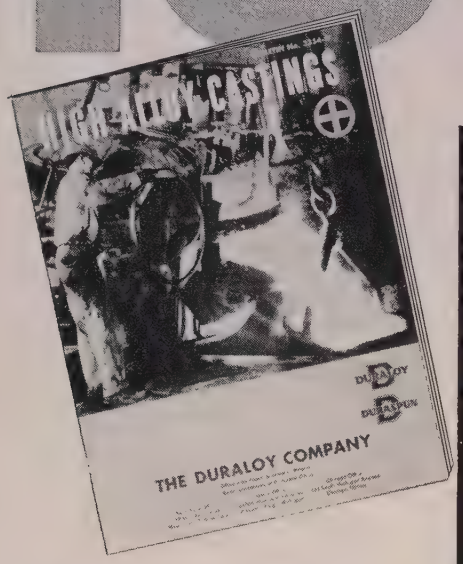
George F. Wales, *Chairman*

585 Payne Ave., North Tonawanda, N. Y.

(Between Buffalo and Niagara Falls)

Specialists in Punching and Notching Equipment

16 pages of useful information about

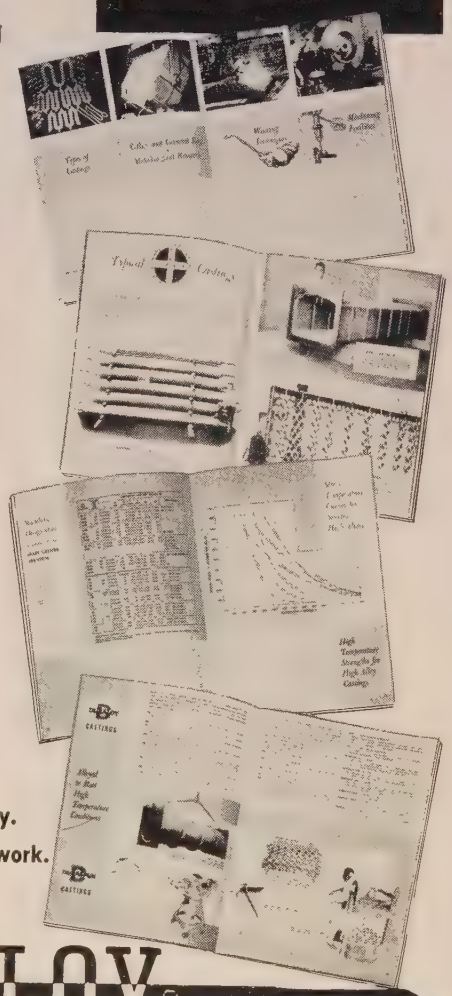


HIGH ALLOY CASTINGS

DURALOY DURASPUN

This is our New General Bulletin—3354G. It's full of information and data on the chrome-iron and chrome-nickel castings so necessary when corrosion, high temperatures and abrasion must be resisted. It will serve as a general selection guide for those specifying or using such castings.

The bulletin also reviews briefly our experience in both static and centrifugal castings, an experience going back to the pioneering days of 1922 and 1933 respectively. It also tells about our facilities for furnishing castings to any desired analysis, welding, X-ray and gamma ray testing, metallurgical and foundry control.



WRITE or CALL our nearest office for a copy.
We believe you will find it helpful in your work.

THE DURALOY COMPANY
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EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 332 South Michigan Avenue

periclase, periclase-chrome and chrome-periclase types.

Buys Rockwell Drill Unit Line

Hartford Special Machinery Co., Hartford, Conn., purchased the complete line of Rockwell (Delta-Milwaukee) hydraulic drill units from Rockwell Mfg. Co., Pittsburgh. They are being manufactured by Hartford Special's Machine Tool Division in its Simsbury, Conn., plant.

IBM To Build Kingston Plant

International Business Machines Corp., New York, will shift the entire assembly and a portion of its parts production of electric typewriters from Poughkeepsie, N. Y., to Kingston, N. Y. IBM will build a 322,000-sq-ft plant there. The vacated space at Poughkeepsie will be used for its expanded electronic data processing machine manufacturing program.

Peerless Electric Expands

Peerless Electric Co., Warren, O., started construction of a $350,000 plant that will permit the company's Fan & Blower Division to double production. Operations in the new building are scheduled to begin about Dec. 1.

The division produces about 250 different fans and blowers. After operations begin in the new building, up to 400 different sizes and types will be made. Most new models will be in larger sizes.

Dreis & Krump Adds Plant

Dreis & Krump Mfg. Co., Chicago, manufacturer of press brakes and presses of 11 to 150-ton capacities, built a 40,000-sq-ft building equipped to handle welding, frame machining and assembly.

National-U.S. Radiator Formed

National Radiator Co., Johnstown, Pa., merged with United States Radiator Corp., Detroit, to form the National-U. S. Radiator Corp. General offices are located at 221 Central Ave., Johnstown. Officers of the new company include: W. C. McCord, chairman of the board; T. B. Focke, president;

As a companion to its line of Type M Unibrake Motors with magnetic braking . . . Master now offers a line of Type D Unibrake Motors with dynamic braking.

HOW IT WORKS. Dynamic braking is obtained with a patented* unique, multi-polar brake winding superimposed on the stator winding of any Master single-phase or polyphase induction motor.

ADVANTAGES. Unibrake motors with dynamic braking are very compact, usually no larger than the standard motor. And since the dynamic brake has no moving parts, there is no wear . . . nothing to adjust . . . braking torque remains uniform.

INCREASE PRODUCTION. Don't waste valuable production time waiting for machinery to coast to a stop . . . get quick slow-down for machine tool spindles . . . quick turn-around time on many operations . . . speed up automatic cycling of machinery. And since Type D Unibrake Motors come to a rolling stop, they are particularly adaptable to equipment requiring gear shift between cycles.

SIZES. Now available up to 30 horsepower . . . larger ratings are being developed. Master Gearmotors and variable speed drives can also be supplied with Type D Unibrakes.

LITERATURE. For complete information write for Data 3810.

Now

DYNAMIC BRAKING

for A-C motors

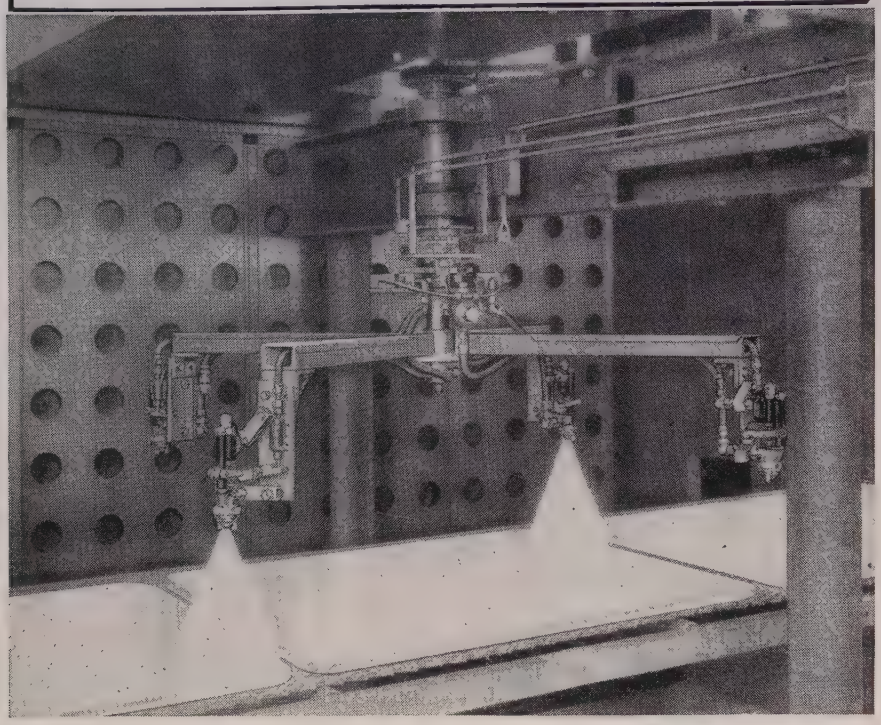
THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

MASTER

UNIBRAKE MOTORS

* U. S. Patent 2,627,059

WHAT'S NEW in automatic spray painting



New rotary spray painting unit finishes flatware at 100 ft./min.

This new automatic rotary spray painting machine has three major advantages over previous automatic equipment: (1) It applies uniform coatings at extremely high conveyor speeds. Outstanding results have been obtained with the conveyor running as fast as 100 feet per minute. (2) Close synchronization of the rotating speed to the conveyor speed is made possible with the precise built-in variable speed drive. (3) Maintenance is greatly reduced. There are fewer moving parts in the new rotary machine and they travel continuously in one direction at low speeds, reducing vibration, wear.

Overspray reduced to minimum

The spray guns operate only when they are directly over the product. Each turns on automatically when it reaches the edge of the product and shuts off as it leaves. The length of time the guns are in operation can be changed while the machine is operating.

Other special automatic units

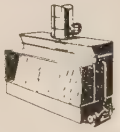
In addition to the Rotary Unit, Binks offers the Automatic Reciprocating Machine and the Automatic Spindle Machine. Virtually any product can be finished automatically with one of these three machines.

For further information

If you are interested in automatic finishing, Binks will gladly analyze your operation and make a specific recommendation. There is absolutely no obligation. Just write to the address below:

Binks
EVERYTHING FOR SPRAY PAINTING

GUNS


SPRAY BOOTHS

FREE INSTRUCTION

BINKS MANUFACTURING COMPANY
3122-30 Carroll Ave., West, Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U. S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

L. L. Hotsenpiller, executive assistant to the president; C. M. Baumgardner, vice president-sales; H. B. Steggall, vice president-manufacturing; J. C. Haas, vice president.

Texas Apparatus Co. Formed

Texas Apparatus Co. has been organized in Houston to specialize in the production of electrical distribution apparatus, control panels, materials handling equipment and specialty steel fabrication. W. E. Brice is president.

Firth Sterling Buys Firm

Firth Sterling Inc., Pittsburgh, acquired Houston Carbide Corp., Houston, and will operate the property as a division. The Houston plant is equipped for pressing, sintering and shaping a wide variety of carbide products.

Baldwin Builds Hopper Cars

Baldwin-Lima-Hamilton Corp., Philadelphia, is building 45 ore-carrying hopper cars for the San Manuel Copper Corp., San Manuel, Ariz. Each car has a capacity of 100 tons. These bottom dump cars weigh 68,000 lb and are equipped with automatic, air-operated, clamshell doors.

Chain Belt Plans Expansion

Chain Belt Co., Milwaukee, purchased a building site near Downers Grove, Ill., to expand manufacturing facilities of its Shafer Bearing Division.

Electronicast Changes Hands

Electronicast Inc., producer of precision investment castings and formerly located in Chicago, was acquired by P. J. Nilsen, owner of Nilsen Mfg. Co., Addison, Ill. Electronicast, whose facilities were moved to Addison, retains its name and continues to make investment castings. Capacity has been more than doubled with addition of new equipment. Machining capacity for toolmaking and secondary operations has been increased substantially through the availability of facilities in the Nilsen plant which makes elec-

MEMORANDUM
Write to J+L for this new book on the modern method of heat treating cold finished steel bars
NOTE:
Electreat (the modern J&L method) is characterized by exceptionally accurate control of heating and quenching.
Electreated bars can be used to produce parts having heat-treated properties—without the need for costly and perhaps undesirable heat-treating operations.
For some products, you may use Electreated carbon steel in place of alloy steel.
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For Reliable Rectifier Operation Get

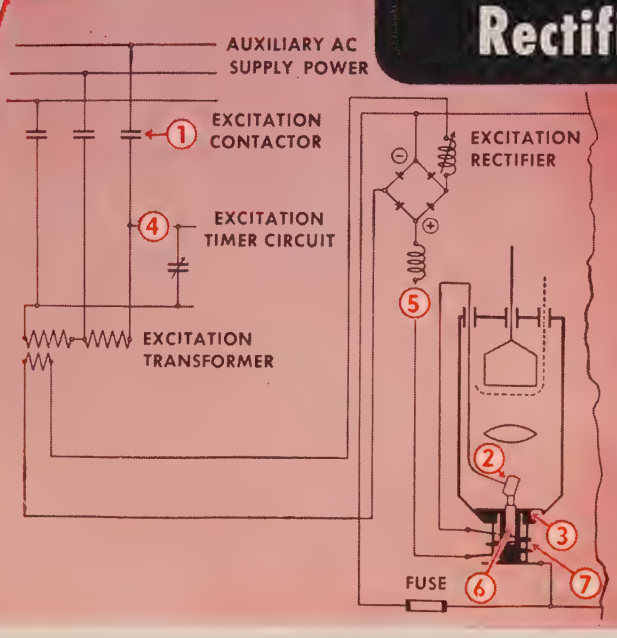
Continuous Excitation

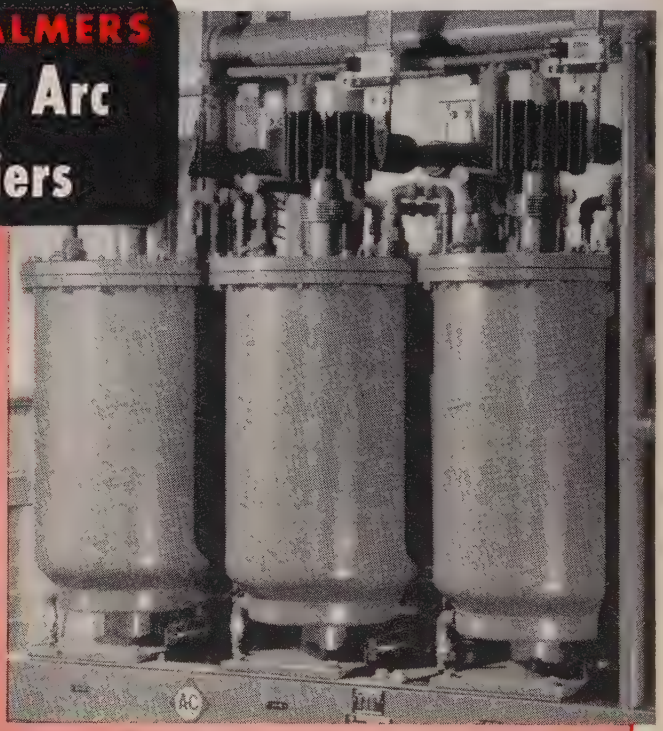
Allis-Chalmers excitron rectifiers eliminate the need for a pulse-type firing system timed for operation every cycle. Maintenance is easy because of the simplicity of design.

A small dc excitation arc is automatically ignited only once, when the unit is started, and then maintained on the mercury cathode of each rectifier tube. It offers advantages similar to a pilot light. Since it is far easier to maintain an arc than to start it, this feature makes the excitron far less likely to lose excitation during power supply disturbances than other types of rectifiers.

Get all the facts about excitron rectifiers before your next installation. Call the A-C office nearest you or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS
Mercury Arc Rectifiers





Supply of DC Provides Key to Continuous Excitation

Direct current supplied from excitation rectifiers is the key to continuous excitation. When the excitation system is energized by means of a contactor (1), positive dc potential appears on the excitation anode (2) of each tube, negative at the cathode (3). A timer (4), through contacts of the excitation failure relay (5), is energized at the same time.

As soon as voltage is applied, current flows from the anode to the cathode through the ignition plunger (6). This current energizes the ignition coil (7) and causes the plunger to be pulled below the mercury surface. As the plunger travels down, an arc is drawn which transfers from the graphite tip of the plunger to the mercury. This current flow keeps the coil energized, maintaining a continuous arc.

If excitation failure should occur while the rectifier is carrying load, the plunger is released, floating upward in the mercury until it makes contact with the anode, then repeating the process above until the arc is re-established.

Re-establishment of the arc as outlined takes less than a second — it does not interfere with normal operation.

ALLIS-CHALMERS

A-C ALLIS CHALMERS

A-4592

ronic parts. Metals cast include carbon and alloy steels, stainless steels, brass and bronze, aluminum and special alloys.

General Controls Buys Firm

General Controls Co., Glendale, Calif., manufacturer of level, pressure and flow controls, purchased the Controls & Instrument Division of Perfex Corp., Milwaukee, manufacturer of oil burner, limit and other controls.

Bristol Moves Subsidiary

Bristol Brass Corp., Bristol, Conn., is building a 60,000-sq-ft plant in Bristol to house the operations of its recently acquired subsidiary, the Accurate Brass Corp. of Glendale, N. Y. A producer of forgings, Accurate Brass will move to the new plant about Oct. 1.

North Is Named Chairman

Raymond E. North is chairman of the board, Lincoln Park Industries Inc., Lincoln Park, Mich. It was stated in the Mar. 28 issue of STEEL, page 68, that he is president. Other officers of the company are: Lawrence W. Howe, president and general manager; John E. Delaney, vice president; R. G. Field, treasurer; C. A. Wilson, secretary; and R. H. Nilsen, controller.

ASSOCIATIONS

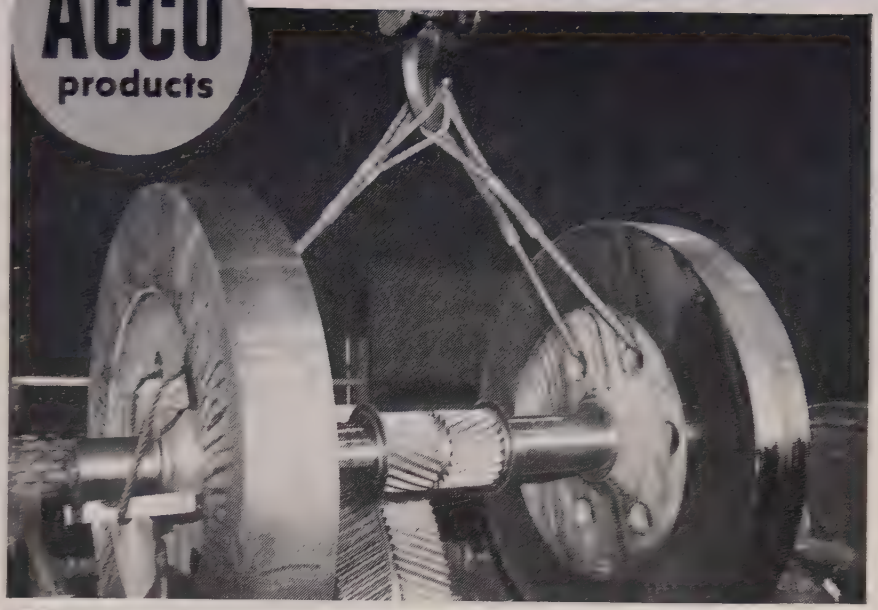
Edward Mackasek retires as managing director of the **Porcelain Enamel Institute**, Washington, on May 1. He will be succeeded by John C. Oliver, who will continue as secretary. Glenn A. Hutt of Ferro Corp., Cleveland, is president.

National Fluid Power Association, Evanston, Ill., elected John E. Erskine of Racine Hydraulics & Machinery Inc., Racine, Wis., president. Other officers are: O. Wendell Macy, Hydraulic Press Mfg. Co., Mt. Gilead, O., first vice president; J. J. Pippenger, Double A Products Co., Manchester, Mich., second vice president; Ellwood G.

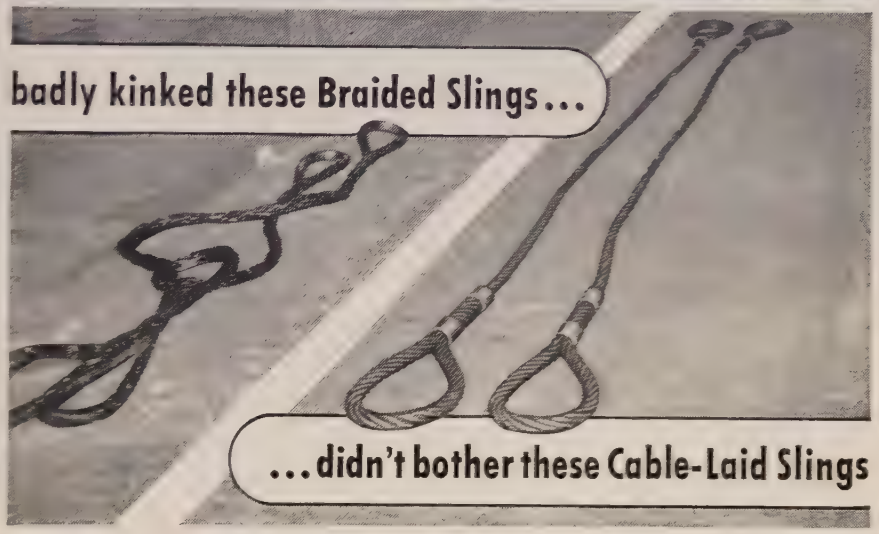
(*Please turn to page* 92)

ACCO products

This 34-Ton Load...



badly kinked these Braided Slings...



...didn't bother these Cable-Laid Slings

Here's Why:

Because these ACCO *Registered* CABLE-LAID slings combine the flexibility of manila rope with the strength of steel.

The secret of the CABLE-LAID sling is in the construction of the rope. It's a combination of six wire ropes laid around a special steel center to give you a rugged steel body which has:

- Freedom from Crankiness
- Extreme Flexibility
- Resistance to Kinking

With their patented DUALOC endings these CABLE-LAID slings are tops in ease of handling . . . resist abuse . . . and give you longer sling life which reduces lifting costs. And these slings are ACCO *Registered*—with all the advantages that make this specification the standard of efficiency and safety.

See your ACCO Registered distributor or write our Wilkes-Barre, Pa., office today

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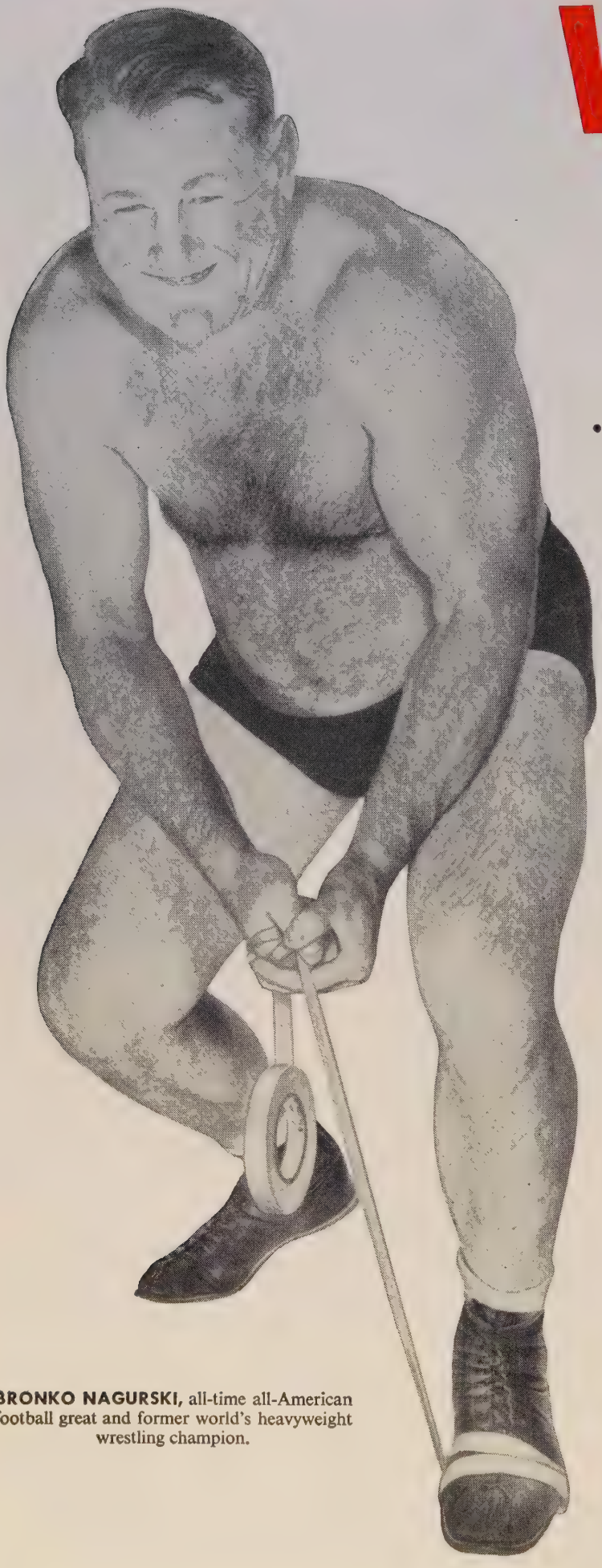
World's



BRONKO NAGURSKI, all-time all-American football great and former world's heavyweight wrestling champion.

....even "The Bronk" can't break it!

Super-strong . . . amazingly shock-resistant! "SCOTCH" Brand Filament Tape has up to 500 lbs. tensile strength per inch of tape width . . . can give and recover under repeated impact to more than withstand the requirements of heavy-duty packaging and materials handling. Furthermore, the exclusive "mirror-surface" adhesive sticks at a touch . . . holds firmly. Truly a "tool" of industry, "SCOTCH" Brand Filament Tape is daily finding new uses in metalworking plants: for banding, holding, reinforcing, palletizing . . . to name just a few. Use the coupon for complete information on how it can cut costs and make tough jobs easier in *your* plant.

Other "SCOTCH" Brand PRESSURE-SENSITIVE TAPES YOU SHOULD KNOW ABOUT:

"SCOTCH" Cellophane Tape: 12 colors and transparent—crystal clear . . . sticks at a touch.

"SCOTCH" Masking Tape: flexible creped backing conforms easily to curves and irregular surfaces.

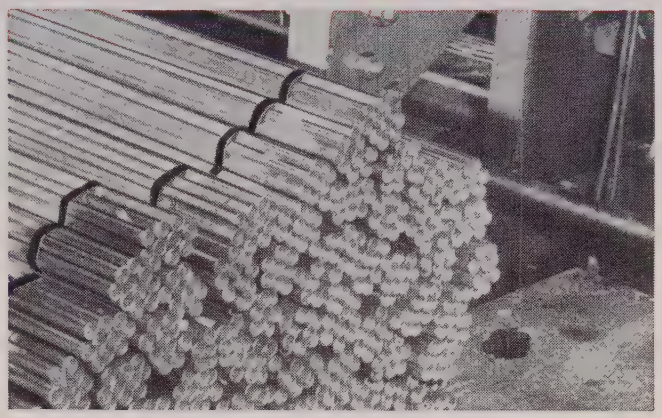
"SCOTCH" Double-Coated Tapes: tapes that stick on *both* sides for bonding, mounting, laminating.

"SCOTCH" Acetate Fibre Tape: long-aging, moisture-resistant, actually sticks at below-freezing temperatures.

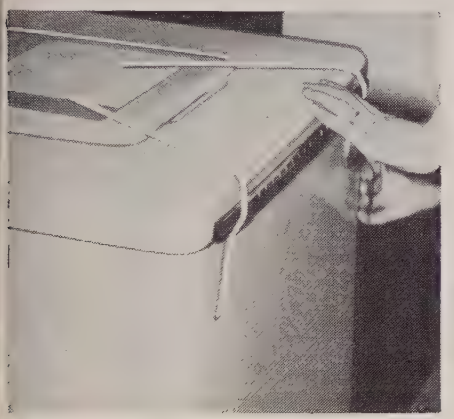
"SCOTCH" Plastic Tapes: eight vivid colors; thin, tough, stretchy; resist acids, alkalies, common solvents.

Strongest Tape?

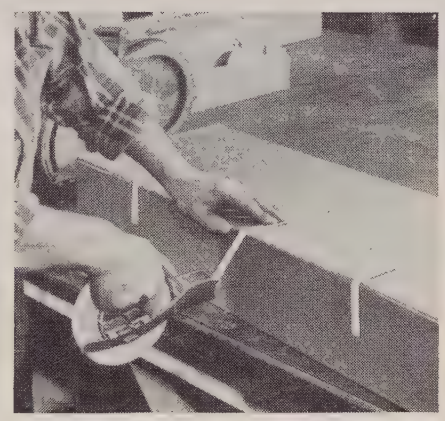
Bulky objects are easily wrapped and secured with "SCOTCH" Brand Filament Tape. Above: as automobile bumpers are lowered into wrapping cradle, automatic dispensers deliver predetermined lengths of 3/8" tape to workers. Easy, dependable and economical wrapping at production-line speeds.



Production-line bundling of conduit, rigid wall pipe, or bar stock is possible with "SCOTCH" Brand Filament Tape and automatic bundler. Machine wraps three bundles a minute. Tight-holding "SCOTCH" Filament Tape sticks securely; can be used on odd and irregular-shaped metal pieces as well.



Stain-resistant, "SCOTCH" Brand Filament Tape can safely be used on porcelain or enamel surfaces. Above, same tape that secures washer door in transit also holds operating instructions. Use it for holding drawers, panels and small parts in place during shipment. Tape won't scratch; holds firmly.



Reinforcing heavy cartons and packages is an everyday job for "SCOTCH" Brand Filament Tape. Tape won't cut into or crush cartons and contents; is easily applied without danger of cutting workmen's hands; is easy to dispose of by receiver. Positive, safe closures; *dependable* reinforcing!

In materials handling, "SCOTCH" Brand Filament Tape can *palletize.* One or two complete bands of tape securely hold cartons; make handling and stacking easier, faster. Note: Other "SCOTCH" Brand Tapes can also save time and money for you. Use the coupon for complete information.

There are more than

300 Pressure-Sensitive Tapes

for industry, trademarked...

Reg. U.S. Pat. Off.

SCOTCH BRAND

The term "Scotch" is a registered trademark of Minnesota Mining and Manufacturing Company, St. Paul 6, Minn. Export Sales Office: 99 Park Avenue, New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

Order "SCOTCH" Brand Tapes from your regular distributor, or use this coupon for complete information

MINNESOTA MINING AND MFG. CO. S-45
St. Paul 6, Minn.

Please send me complete information on items checked:

- ☐ Filament Tape
- ☐ Masking Tape
- ☐ Acetate-Fibre Tape
- ☐ Cellophane Tape
- ☐ Double-Coated Tape
- ☐ Plastic Tape
- ☐ Uses of Pressure-Sensitive Tapes in packaging and shipping
- ☐ Automatic and Semi-Automatic Tape applying equipment

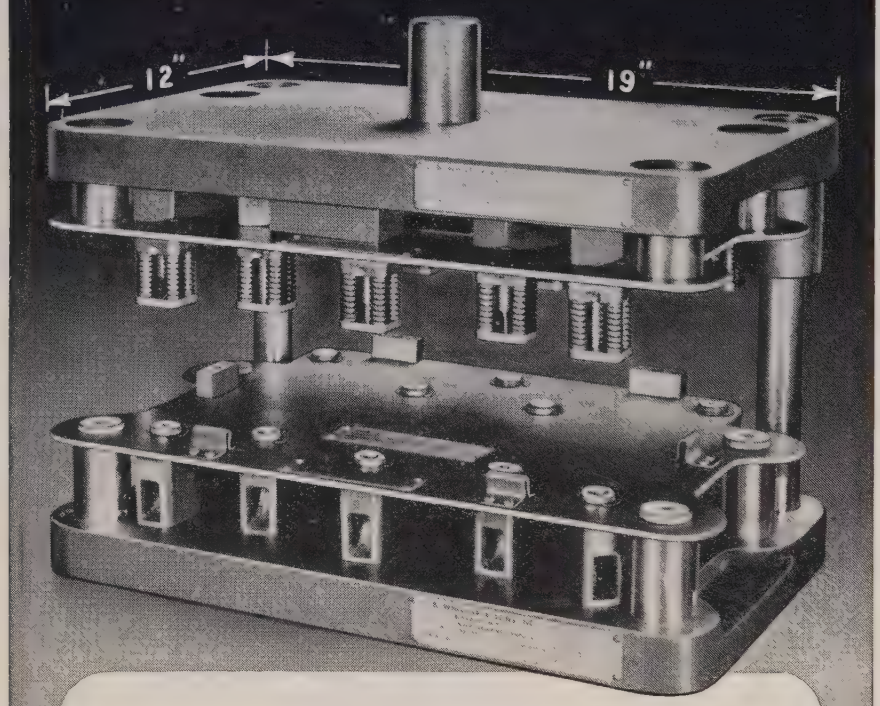
NAME.....TITLE.....

COMPANY.....

ADDRESS.....

CITY.....ZONE...STATE.....

SPECIAL INTRODUCTORY UNIT



WHISTLER

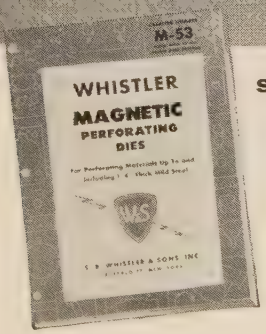
10 HOLE MAGNETIC PERFORATING DIE

Cut die costs drastically, start production quicker

This M-12-14 Complete Introductory Unit includes a set of blank templates, ten punches, dies, strippers and punch and die retainers complete to make up a ten hole precision perforating die. Any diameters from ⅛″ to ½″ to your selection. Catalog illustrates additional re-use economies.

$675 NET F. O. B. OUR PLANT

WHISTLER DIES ARE CUTTING COSTS FROM COAST TO COAST



SEND FOR CATALOG Illustration shows how quick and simple it is to set up a Whistler Magnetic Perforating Die ready for production. Larger standard units can be added to suit your requirements.

S. B. WHISTLER & SONS, INC.

Manufacturers of Adjustable, Magnetic and Custom Built Dies for All Industry

742 Military Road **Buffalo 23, New York**

(Concluded from page 89)

Peterson, Hannifin Corp., Chicago, treasurer; Barrett Rogers, Evanston, executive secretary.

Society of Die Casting Engineers has been organized "to foster and further technological advances in the fields of die casting, finishing of metals and die molding of plastics and powdered metals." National headquarters is at 19370 James Couzens Highway, Detroit 35, Mich.

J. Carl Bode was elected president of the **International Acetylene Association,** New York. Mr. Bode is president of National Carbide Co., a division of Air Reduction Co. Inc., New York.

REPRESENTATIVES

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed William M. Orr Co. Inc., Pittsburgh, a distributor of Kaiser aluminum mill products, including sheet, rod, bar and wire, extruded shapes and tubing.

Cooper Alloy Corp., Hillside, N. J., appointed Cameron & Barkley Co., Charleston, S. C., distributor of its stainless steel valves, fittings and accessories.

Mork-Witthauer Equipment Co., Minneapolis, was appointed to sell and service the Michigan line of excavator-cranes and tractor shovels. They are manufactured by Construction Machinery Division of Clark Equipment Co., Benton Harbor, Mich.

NEW ADDRESSES

Carpenter Steel Co., Reading, Pa., moved its eastern regional sales office from Newark, N. J., to the division's home office and mill at Union, N. J. Paul E. Kelly continues as eastern regional sales manager.

Revere Copper & Brass Inc., New York, moved its Minneapolis office to larger quarters at 5620 W. Broadway, that city.

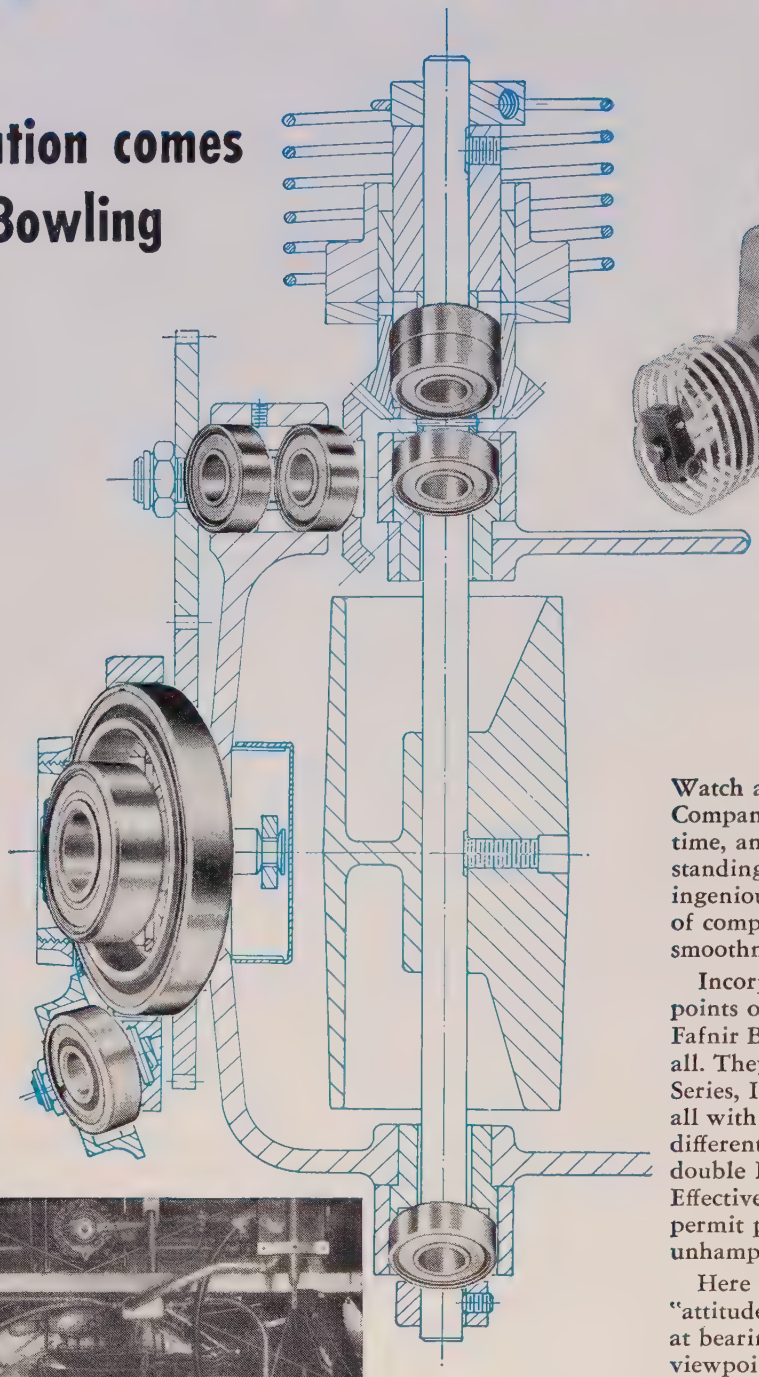
McLouth STAINLESS Steel

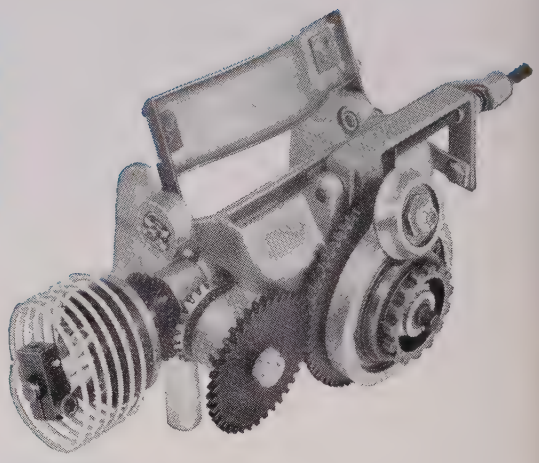
High quality stainless sheet and strip steel . . . for the product you make today and the product you plan for tomorrow.

McLouth Steel Corporation
DETROIT, MICHIGAN
Manufacturers of Stainless and Carbon Steels

Turning Points to more Efficient "Pin Boys"!

Automation comes to Bowling



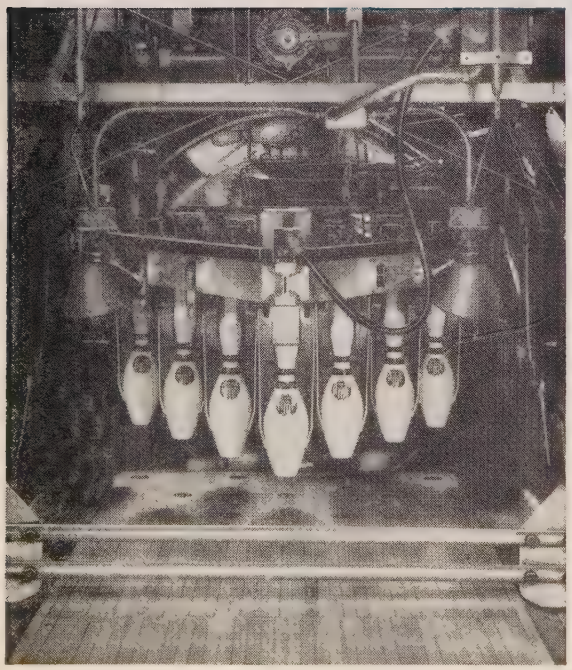


Section of Pin Distributor Drive Head Assembly equipped with six Fafnir Extra Small Series Double-Shielded Ball Bearings including a duplex arrangement plus a 200 Series Plya-Seal Bearing located in housing within an Aircraft Type Bearing . . . also another 200 Series Bearing with Plya-Seals.

Watch an American Machine & Foundry Company Pinspotter in operation sometime, and you'll agree that it's an outstanding example of automation. This ingenious machine performs a multiplicity of complicated operations with amazing smoothness and dependability.

Incorporated in many of the turning points of the Automatic Pinspotter are Fafnir Ball Bearings . . . forty of them in all. They include several sizes of the 200 Series, Inch Type, and Extra Small Series, all with double grease shields . . . also three different Aircraft Type Ball Bearings with double Plya-Seals and a Flangette. Effectively placed, these ball bearings permit precise coordination of motion unhampered by friction.

Here is another example of the Fafnir "attitude and aptitude" . . . a way of looking at bearing problems from the designer's viewpoint, plus coming up with the right bearing to fit the need. Automation problems and solutions are part of Fafnir's industry-wide experience. If you need the advantages of such experience, let Fafnir help you. The Fafnir Bearing Company, New Britain, Conn.



AMF Automatic Pinspotter is shown in process of lowering pins.

FAFNIR

BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

Technical Outlook

SYNTHETIC CUTTING FLUID—In machining titanium, tool life is 300 to 500 times longer when a new water-soluble cutting fluid is used in place of solubilized oils. Developed by Carbide and Carbon Chemicals Co., Ucon Cutting Fluid H-660 is used in a 1:5 dilution with water. It's also effective in machining, cutting, forming and grinding operations on carbon and stainless steels, chrome-molybdenum, vanadium steels, Nitralloy, the Stellites and Hastelloys and many nonferrous metals.

SUBMERGED MOTOR—Instead of designing a high-octane, gas-pump motor that would resist seepage of fluid or vapors, General Electric engineers did the opposite. They've got a ¾-hp motor designed to be flooded with gasoline, the fluid acting as coolant and bearing lubricant. Windings and stator core are, of course, completely sealed in an impervious, epoxy-resin material.

ELECTRONICS AT WORK—Electronic liquid-level gaging can be handled by remote control. You query any of a group of tanks by dialing a number; the tank identifies itself and transmits its liquid level to a receiver which records the information.

TRANSISTOR POWER—Transistors developed for the Army Signal Corps will handle enough power to be substitutes for dynamotors and vibrator power convertors presently in use. Fewer moving parts to wear out and less radio noise are immediate gains.

JET WHISPERS—Flight propulsion researchers feel that the next move in raising operating temperatures of jet turbine blades (and a resultant boost in thrust) will involve a sectionalized, hollow blade. Success is reported with a furnace-brazed assembly made up of a low-alloy-sheet fin section and a 4130 base. About 5 per cent of the jet compressor's air output would be diverted to the turbine blades for cooling, but it would permit operating flame temperatures close to 2000° F. Just as important, each blade would require much less of the critical alloys.

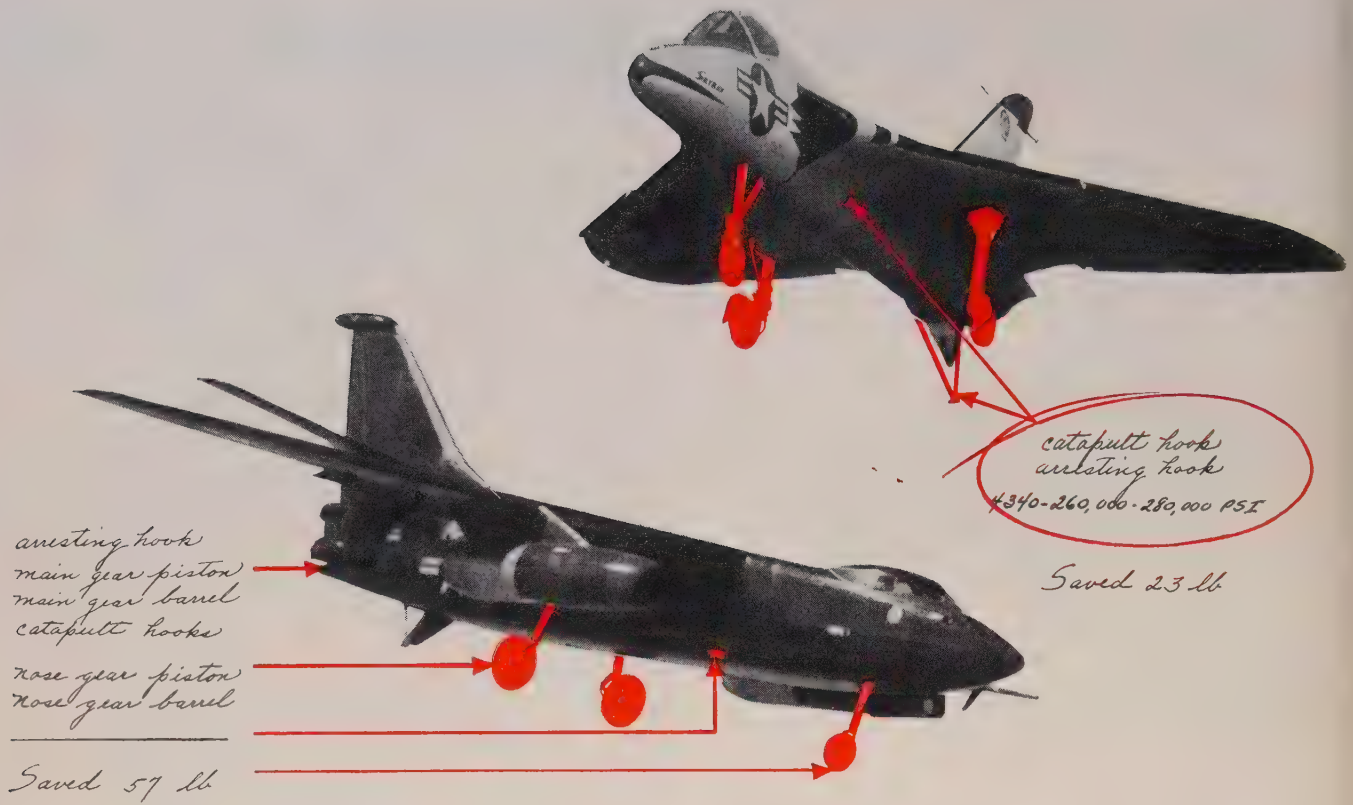
TRICK REFINING—Cage-zone refining is what Westinghouse calls its new process for purifying metals. One application is to take iron out of titanium by concentrating it in the liquid area. A bar of titanium is slowly raised through a high-frequency heating coil. It melts from the inside, but corners remain solid to act as a cage. Impurities are concentrated at the end of the bar. It and impure corners are cut away.

UNIVERSAL ROD—Inco-Rod "A" will make sound welds on better than 90 per cent of dissimilar metal jobs in the average plant, says the International Nickel Co. With its eye on the industrial maintenance market, the company says its just-announced electrode joins mild steel to stainless with excellent strength and ductility.

SAMPLES SELL—International Powder Metallurgy Co., Ridgeway, Pa., spreads the metal powder gospel by sending out samples of parts it has produced accompanied by case histories and complete cost figures. They bring in business says IPM.

ROLL WITH THE PUNCH—Epoxy resins modified with a polysulphide liquid polymer can be used successfully for drop hammer dies. Douglas Aircraft Co., which is using such modified dies for impact forming aluminum, finds that resilience of the die has a smoothing action that helps eliminate wrinkles.

Metalworking Outlook—p. 47 Market Outlook—p. 127



Now headed for other applications, superstrength steels answered need for lightest possible, load-carrying structure for aircraft. Can you use . . .

More Muscles in Steel

By DR. ALLEN G. GRAY
Technical Editor

YOU GENERALLY don't think of steel as a light metal.

But when it takes on tensile properties of 260,000 to 280,000 psi, its strength-weight ratio is above the strongest aluminum and commercial titanium alloys.

Strength levels in this range, and up to 325,000 psi, are obtained with a class of structural steels called the ultra-high-strength type (see table). When quenched and tempered, they provide what aircraft engineers say is the strongest material of the lightest weight.

Although superstrength steels were developed for aircraft, they are ready to take on uses in other products where strength-weight ratio is important.

Light Steel—Compared with a 75ST aluminum extrusion (80,000 psi), steel with a tensile strength of 220,000 psi has about the same strength-weight ratio.

Above 220,000 psi, then, steel is actually lighter than aluminum—load carryingwise. At the 260,000 to 280,000 going level, steel under load is some 15 to 20 per cent lighter than aluminum.

Weight has always been a No. 1 problem with aircraft people. They were accustomed to using 4340 in the 180,000 to 200,000 psi range. Last year they announced processing methods had been worked out which upped strength 40 per cent to the 260,000 to 280,000 range.

Specifics — Lockheed reports: "The 23-per-cent weight saving over the conventional 200,000 psi steel in the same cross-sectional structures gives greater payload for transports."

E. H. Heinemann, chief engineer for Douglas, says: "Our present designs, now on the drafting boards, will use 4340 heat treated to 260,000 to 280,000 psi for most of the major steel landing gear components."

Douglas saved 23 lb on the A4D-1 by sticking to this strength level for its steel catapult and arresting hooks.

In another case, Crucible Steel's regular HY-Tuf (220,000 to 240,000 psi) saved 57 lb on the A3D-1 Skywarrior (see photographs top of this page).

Heat Problem—Still there's another side to the picture for the aircraft people. With the epic crossing of the sound barrier and even greater speeds in sight, skin temperatures become a dominant problem.

When they get above 300° F, the constructional alloy steels look better than the light metals. Steel companies studying compositions

treated to the 200,000—300,000 range say they are good up to at least 450 to 500° F.

More Steel — Those who are closest to the steel-in-aircraft picture predict that use of high-strength steel is bound to grow. Take the comment of R. E. Greenough, vice president for engineering, Cleveland Pneumatic Tool Co. He cites the decrease in the structural envelope (space allotted to the frame) and increased heat due to increased speeds as two of many reasons for the growth.

Pointing to a 3-ft stack of blueprints in his office, he told STEEL: "These are drawings of structural parts for aircraft we have been asked to survey for high-strength steel applications."

Other Uses—Mr. Greenough also expects superstrength steels to find many applications outside aircraft.

Lightweight railroad cars for high-speed trains are a good prospect. Another is airborne army equipment—tanks, jeeps, machine guns, etc. In regular transportation equipment, such as trucks, the high strength-weight ratio can pay dividends.

A tailor-made application, according to Mr. Greenough, is in machinery where inertia is a design problem. When large rotors must come to a sudden stop, the mass can be reduced appreciably.

"We see no reason why the advantages of ultra-high-strength steels should be confined to aircraft," says J. W. Sands, International Nickel Co. Mr. Sands, who has been active in developing Inco Steel for the 280,000—300,000 psi level, adds:

"Reduction in weight without loss in strength, or even with better strength, is attractive to other transportation fields and for products that must be frequently transported. There is a bright future for applications where functioning can be improved or more economical operation achieved."

Expand Limits—Mr. Sands continues: "To compete with lighter materials in many applications, the strength level for engineering alloy steels must be pushed upward.

"When this is done, the intrinsically heavier steels have the added advantage of a savings in space as well as weight. This can be of interest in applications where weight saving, per se, is of secondary importance."

More Evidence—Along the same vein, M. W. Lightner, assistant vice president, research and technology, U. S. Steel Corp., predicts that ultra-high-strength steels "will ultimately be used for a wide range of applications.

"They have been shown to have adequate notch toughness for critical aircraft uses . . . their fatigue strength is high, so they should find applications in heavy machinery operating at high stresses.

"Although their acceptance for commercial applications will undoubtedly be a gradual process . . . the present trend toward machines and equipment operating at higher and higher stress levels would seem to make their ultimate use a certainty."

Growing, Too — "Our superstrength steel, HY-Tuf, is finding new applications outside airframe and landing gear for which it was developed," reports W. H. McCormick, a sales manager at Crucible Steel Co. of America, stating:

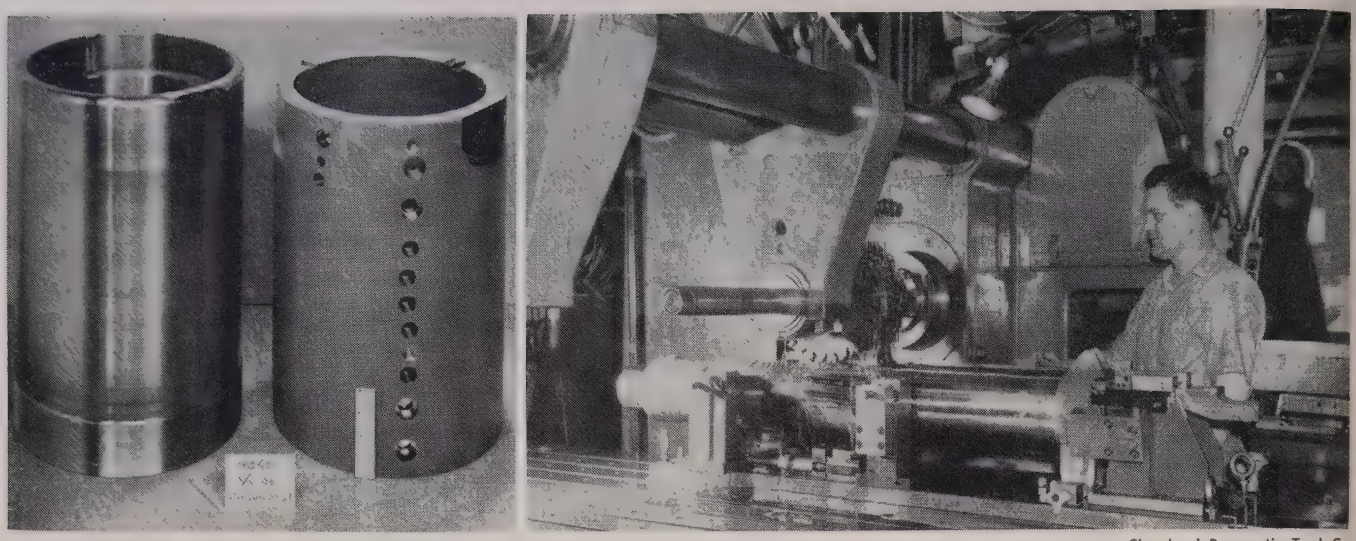
"Special tools, for example, where the designer must limit weight and cross-sectional dimensions, require higher tensile strength. Such designs usually do not permit sufficient fillet or radius for standard alloys. A higher impact and less notch sensitive alloy is required. Long thin end wrenches and some types of socket wrenches are typical."

". . . constructional parts, partic-

Typical Superstrength Structural Steels

Material	Composition—per cent	Tensile Strength—psi
SAE 4340	0.40 C; 0.65 Mn; 0.30 Si; 0.80 Cr; 1.80 Ni; 0.25 Mo	260,000 to 300,000
SAE 4360	0.60 C version of 4340	280,000 to 300,000
Crucible HY-Tuf	0.25 C; 1.35 Mn; 1.50 Si; 1.80 Ni; 0.25 Cr; 0.40 Mo	230,000
Crucible Super HY-Tuf	0.40 C; 1.30 Mn; 2.30 Si; 1.40 Cr; 0.20 V; 0.35 Mo	294,000
Crucible High Carbon Super HY-Tuf	0.47 C; 1.28 Mn; 1.85 Si; 1.11 Cr; 0.25 V; 0.42 Mo	325,000
Mod. 98BV40 U. S. Steel	0.35 to 0.40 C; 0.85 Mn; 0.70 Si; 0.80 Ni; 0.75 Cr; 0.50 Mo; 0.06 V; 0.0015 B	260,000 to 280,000
Mod. 98BV40 U. S. Steel	0.40 to 0.45 C version of above	280,000 to 300,000
SAE 4330 modified with Vanadium (AMS 6427)	0.30 C; 0.90 Mn; 0.30 Si; 1.80 Ni; 0.85 Cr; 0.45 Mo; 0.05 to 0.10 V	220,000 to 240,000
Timken H. S. 220 (AMS 6407)	0.30 C; 0.70 Mn; 0.60 Si; 2.05 Ni; 1.20 Cr; 0.45 Mo	220,000 to 240,000
Timken H. S. 260	0.40 C; 0.70 Mn; 0.60 Si; 1.20 Cr; 2.05 Ni; 0.45 Mo	260,000 to 280,000
International Nickel Co. Inco Steel	0.40 C; 0.70 Mn; 1.60 Si; 1.90 Ni; 0.90 Cr; 0.45 Mo; 0.07 V; 0.02 Al	280,000 to 300,000
British En. 30B	0.30 C; 0.50 Mn; 0.22 Si; 4.10 Ni; 1.25 Cr; 0.30 Mo	240,000 to 280,000

Compiled by STEEL



Cleveland Pneumatic Tool Co.

These 4340 experimental parts were machined at 310,000 psi strength level. Hardness: Rc 56

Cylinders for Lockheed landing gears are milled at the 260,000 to 280,000 psi level on Kearney & Trecker horizontal miller

ularly where abrupt change of cross section is involved, are logical applications. Examples are axles, gears and shafting of all types.

". . . by taking advantage of high strength and high toughness, weight can be saved by reducing the cross section. This means constructional applications range from those found on heavy, earth-moving equipment and four-wheel-drive vehicles with power takeoff to power tools, such as found in the basement workshop."

Portable — Power-driven garden tools and all types of portable motors where strength-weight ratio is important are logical end uses, according to Mr. McCormick.

"As an example, our HY-Tuf is being used for various parts of hand and power-operated banding machines."

The HY-Tuf composition is used for detachable bit bodies and rock drills for mining. Ingersoll-Rand selected it for its Carset Jackbits. Other uses: Bodies for inserted tooth saws, bolts for cutter heads, couplings on automatic screw machines, pinion gears for locomotives, shafts for coal mine machines and speed reducers.

Guide Posts—In developing alloy steels of high toughness at tensile strengths above 200,000 psi, metallurgists keep certain fundamental concepts in mind:

First, the alloy content must give a martensitic structure in any size section required for the application. The best combination of strength and notch toughness comes from tempering a completely martensitic structure at a low tempering temperature to a high hardness level.

Second Point—The carbon content must be as low as possible to give the required strength level after heat treatment.

A third point is to avoid tempering at a temperature that may cause embrittlement.

There are a number of relatively low alloy steels that live up to these principles.

Boron Helps — Our preference is for a low alloy boron steel. It fulfills these requirements with minimum expenditure of critical alloying elements, reports U. S. Steel's Mr. Lightner.

Question Mark — But keep in mind, too, that high strength is not all important. Other factors, also, come into the picture.

Here's how one expert puts it: "When people start considering steel with a strength of 300,000 psi for structural applications, it is with mixed emotions.

"The high strengths are desired for their weight saving advantages, yet there is fear of low ductility which accompanies high strength."

Data — Let's take a look at mechanical properties reported by Crucible Steel researcher, A. E. Nehrenberg:

When heat treated to 294,000 psi tensile strength, Super HY-Tuf (see table) has a room temperature V-notch Charpy value of 14 ft-lb. At −40° F the Charpy value is 11 ft-lb. The elongation in 2 in. is 10 per cent and reduction of area 35 per cent.

These properties appear to be typical for a 300,000 psi tensile strength steel.

Are they good enough? By comparison, aluminum is used for structural parts with notched-bar impact values of 3 to 8 ft-lb.

Changed—The tensile strength of Super HY-Tuf can be increased above the 300,000-psi level by increasing the carbon content. When carbon is 0.45, the tensile after a 550° F temper is 320,000 psi. The Izod value is 11 ft-lb.

Increase in carbon to 0.49 raises tensile to 330,000 psi, decreases Izod value to 8-ft-lb.

"It's not clear what the limiting Izod value should be," says Mr. Nehrenberg. "The 75S aluminum alloy performs satisfactorily with less than 5 ft-lb Izod. Whether the same value gives adequate toughness for steel structures remains to be established."

Confidence with Caution — But here's one answer: Aircraft engineers consider the superstrength steels definitely a sound aircraft material. So perhaps the fear of failure is premature.

Even so, aircraft users are ever mindful of the possibility of failures. They eliminate anything in processing that might cause trouble. They add steps to minimize trouble spots.

For example, all parts are normalized before heat treating. This tends to level out steel mill processing variables and gives a good structure with minimum scatter of

physical properties.

Another Caution Point — The austenitizing temperature is kept as low as possible to minimize the amount of retained austenite.

Transformation of retained austenite in service parts is bad from two standpoints: It gives untempered martensite, which embrittles the structure; there is an increase in volume, which increases surface tensile residual stress.

Stabilize — Since all retained austenite cannot be eliminated, a special stabilization treatment is used to minimize the effects of later transformation.

Special attention is paid to tempering temperature. Also, treatment time is longer than generally used. Reason is to give a more stable structure.

Decarburization—This is avoided because it reduces the fatigue strength. Machining or (sometimes) shot peening is used to compensate for this factor.

Peening is also used to eliminate tensile residual stresses owing to grinding and straightening operations. Even so, effort is made to avoid distortion.

No chances are taken with hydrogen embrittlement. This means cathodic cleaning is taboo. Chromium plating is eliminated from radii and from some parts entirely.

Dollar Mark—Costwise, what do these processing precautions mean to the user of ultra-high-strength steels?

It means that weight saving is being paid for at the cost of increased processing, more difficult machining and better process control. Also he may have to invest in new equipment.

So he must expect to pay more money for designs using superstrength steels. A 3:1 ratio is not unreasonable.

But with today's emphasis on strength-weight ratio not only for aircraft but for a host of other products as well, it's a good bet that he'll find many parts where it's worthwhile.

For Your File

Extra copies of this article are available in quantities from one to three until supply is exhausted. Write: Technical Editor, STEEL, Penton Bldg., Cleveland 13, O.

Technique for quenching superstrength steel at Cleveland Pneumatic Tool Co. Steps below show . . .

How Superstrength 4340 Steel Is Heat Treated

1. **NORMALIZE**—Parts should be in the normalized condition before heat treating to the 260,000-to-280,000 range. Procedure: Heat to 1625° F ± 25 degrees for 1 to 3 hr, depending on the size of the piece. Then cool in still air. Stress relieving at temperatures not over 1250° F may be performed after normalizing if necessary.

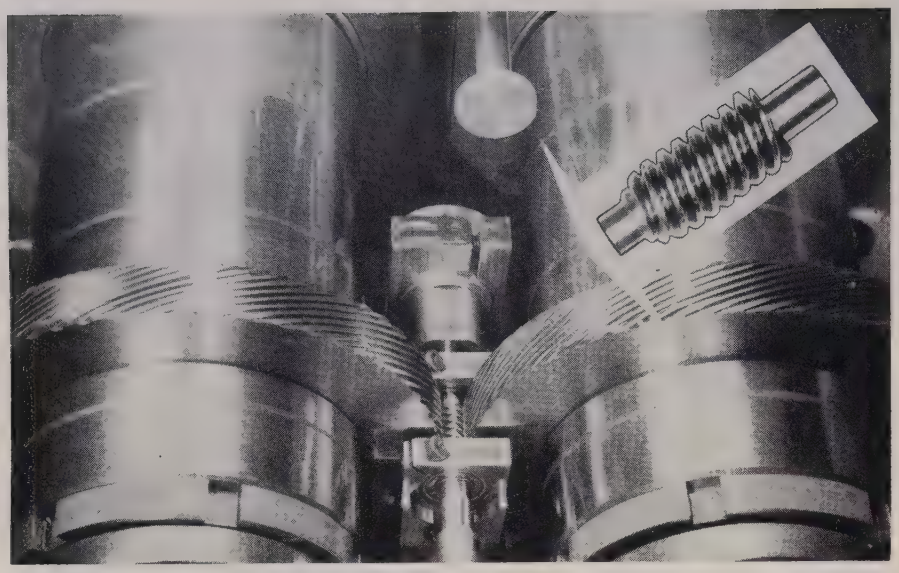
2. **AUSTENITIZE**—Heat parts to 1500° F ±25 degrees and hold at this temperature for 1 to 3 hr. Exact time depends on size of the piece.

3. **QUENCH**—At end of austenitizing cycle, parts are oil quenched. Bath is provided with forced agitation and heat exchangers to keep temperature in range 75 to 140° F. Parts should be quenched to a uniform temperature no higher than 150° F before removing from the quenching bath.

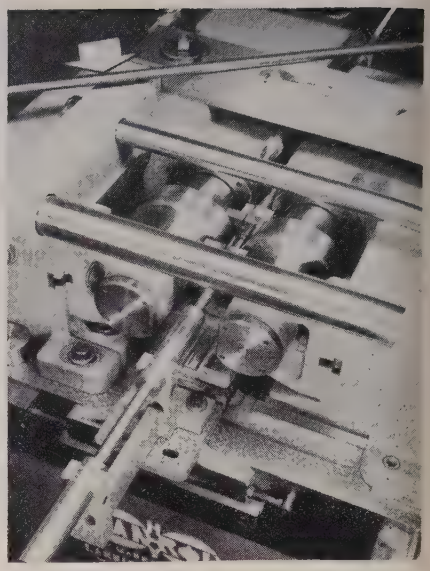
4. **TEMPER**—Parts are given a double temper. Each treatment consists of heating parts to a suitable temperature, normally 400 to 450° F, and holding at that temperature for 2 hr per inch of thickness of the heaviest section. Minimum total tempering time for both treatments is 6 hr.

   Parts are not water or oil cooled after tempering. The first temper is done immediately after the quenching operation (step 3), allowing only time for the oil to drain off.

5. **RETAINED AUSTENITE STABILIZATION**—Parts are heated to 250° F for minimum period of 24 hr. This is the last thermal treatment over 250° F applied to parts.



Triple-worm thread (⅜-in. diameter, 0.1-in. pitch) is rolled on 0.50 carbon alloy steel, 25 Rc. Production: 12 completed parts a minute



Bar of 1018 steel is threaded at 40 linear inches a minute by thrufeeding

Thread Rolling:

Diversification within a Method

With a change in tooling, the thread roller can form close-tolerance threads, can roll worms and splines—even gears. In the works: Rolled bearing races

"ANY MATERIAL that can be flowed can be roll threaded," say engineers at Landis Machine Co., Waynesboro, Pa.

With this thinking, the company has the basis for a wide potential range of workpiece materials for its new thread roller, the Lanhyrol. Although the company has been making a thread rolling attachment for lathes and automatic screw machines, this is its first venture into building a machine to do the job.

Key To Success—Although the machine is designed to produce close-tolerance threads (or produce threads at high production levels), many inquiries have concerned jobs for other rolled forms.

Success or failure of the machine to do a given job within its scope is determined by the tooling, Landis explains. Machine performance is the same essentially for all operations—either the two dies (rolls) will have a fixed center distance, or the center distance will open and close to permit introduction of the workpiece.

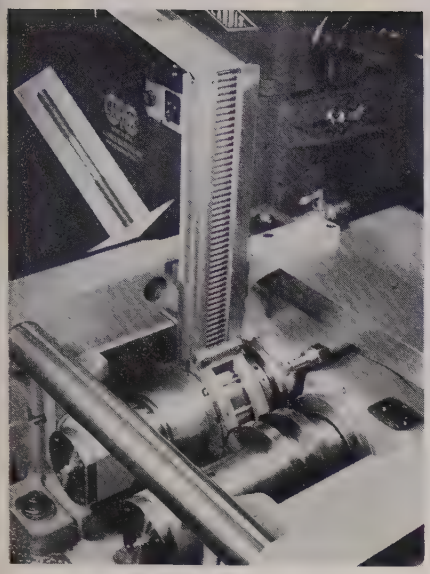
Fixed — If the center distance does not change during the cycle, parts can be fed laterally through the opening between the rolls, coming out on the other side with a completed thread. Also, a segmented die (with notches to permit part entry into the work area) can be synchronized with a feeding mechanism to roll parts continuously.

In the first instance, work is supported on a holding fixture; in the second, the feeding device itself is the fixture.

Moving—If the center distance is changed during the machine cycle to permit part entry, the part is again supported on a workrest. The movable die closes in to squeeze the form on the part.

Parts—Contour of the finished part is controlled by that on the rolls, which are made of high-carbon, high-chrome die steel of the air-hardening type. The form on the die must be carefully ground —surface finish is about 4 microinches rms.

The Landis machine is based on the design of the German Pee-Wee thread roller. Rights to the German patents were purchased by



Two different threads are rolled at once. Production: 76 studs a minute

Landis (STEEL, Apr. 26, 1954, p. 97) along with Western Hemisphere rights to market it.

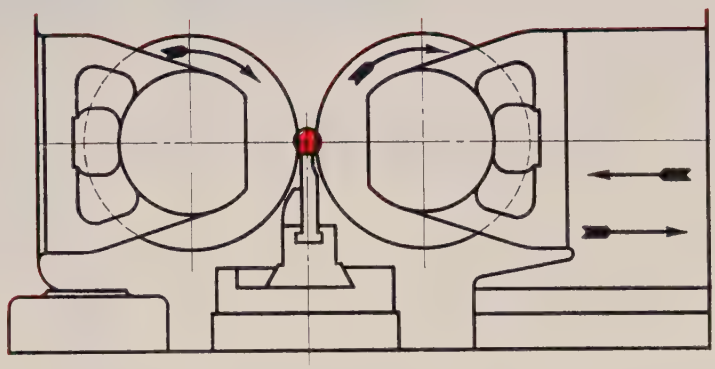
Landis redesigned the Pee-Wee, revamping the control system, the main drive and other machine systems (see p. 117). The Landis machine also is substantially heavier than its German counterpart.

Jobs—So far, the machine has rolled forms on stainless steel, 1020 steel, 4140 steel (300 Brinell), titanium and others. It has formed a wide variety of threads and worms, has rolled gears and splines, is being considered for rolling ball bearing races and has been tried on burnishing bearing seats on a kingpin bolt.

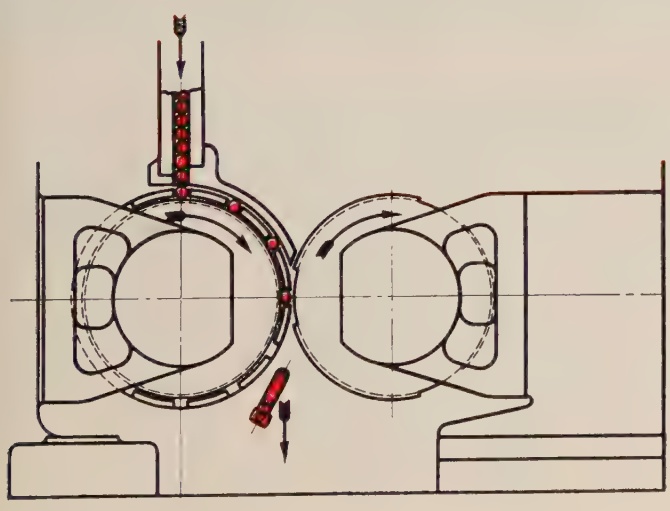
One promising field of application lies in critical-property fasteners like those for aircraft. Thread rolling itself produces a strong thread—metal is cold worked rather than cut. Landis also points out that, if necessary, its machine could form the thread, then finish form it after heat treating.

For practical purposes, Landis engineers have set limits on workpiece material at 36 Rc maximum hardness, 12 per cent minimum elongation. Those values, they add, might be extended to 40 Rc and 8 per cent elongation in some cases.

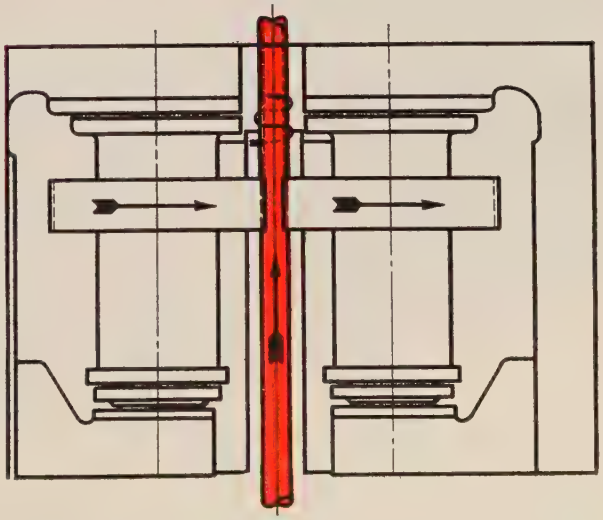
Die life varies with the hardness of the workpiece material. On mild steel parts, die life should be in the magnitude of 500,000 parts, but this will depend on consistency and quality of the stock, both in size and in structure.



Infeed, or plunge, rolling is for threads 5⅞-in. long or less. Workpiece rests on a holding fixture—movable die advances to roll thread between the opposed, threaded rolls



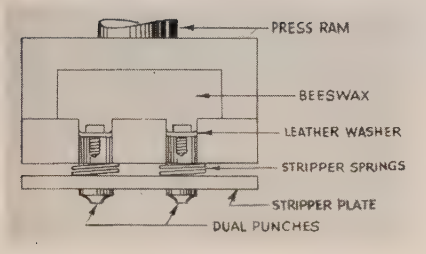
Continuous rolling is for high production—works on pieces with ¾-in. OD or less, 7 in. long or less. Rolls have fixed center distance; revolving cage feeds parts to and from roll position



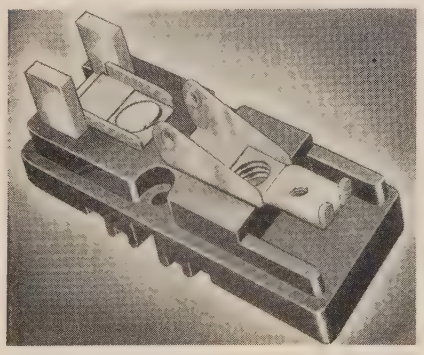
Thrufeed rolling produces threads longer than 5⅞-in. Workpiece is placed on the workrest and passes endwise between the rolls for threading. Center distance of rolls is fixed

This ram press paid for itself in three months by increased production and decreased scrap loss

Sensitive Press Cuts Staking Costs



Detail of beeswax-filled, equalizer head on the dual-punch ram



Six-part, magnetic switch assembly staked together by single ram stroke

STAKING together six parts of a magnetic switch assembly with a single ram stroke at Penn Controls Inc., Goshen, Ind., each year saves four times the cost of the press.

Production has climbed from 212 to 380 units an hour, scrap losses have been reduced 84 per cent and two types of switches can be produced without a change of tooling. One operation, chasing threads on staked parts, has been eliminated.

Automatic Indexing—The press is equipped with a six-station, hydraulic indexing table, which is interlocked through the hydraulic system of the press for positive sequence of movement. This prevents the table from indexing unless the press ram is stationary at its upper stroke limit. The press is operated by three workers who position the parts at three of the six stations as the table indexes the parts under the staking ram.

Parts are hand loaded from bins attached to the press housing. After staking, a cam lifts the finished assemblies out of the fixtures just beyond the work station, and air blows them into a chute which carries them to the next operation.

Press Tooling—A beeswax head equalizes the pressure on the hold-down since the ram does not have a fixed stroke. Instead, it is set for pressure reversal: As soon as the preset pressure is reached, the ram reverses. Thus, the length of the stroke adjusts automatically to variations in thickness of the plastic switch bases or other parts. This tooling is largely responsible for reduction in scrap losses.

The 4-ton Denison Multipress is a self-contained unit of a C-frame type. It provides big press advantages and open height in a size that conserves floor space. Press equipment used before on the staking operation had a fixed stroke. Breakage was commonplace on plastic bases that were slightly too thick; loose fittings were encountered if the bases were too thin. Internal threads on the staked terminal posts were often damaged and had to be chased to be sure there was no distortion.

The Multipress has proved for Penn Controls that lower pressures properly applied produce better quality products than misapplied higher pressures.

Two Switch Models—The index table feed enables two models of the magnetic switch to be staked simultaneously, in a continuous 5:1 ratio—keeping the manufacturer's daily production in accordance with the ratio of sales for the two items.

This is done by equipping five of the stations with fixtures designed for switches using silver contact points. The sixth is equipped with a fixture to accept switches made with platinum contact points.

REVERE

COPPER EXTRUDED SHAPE

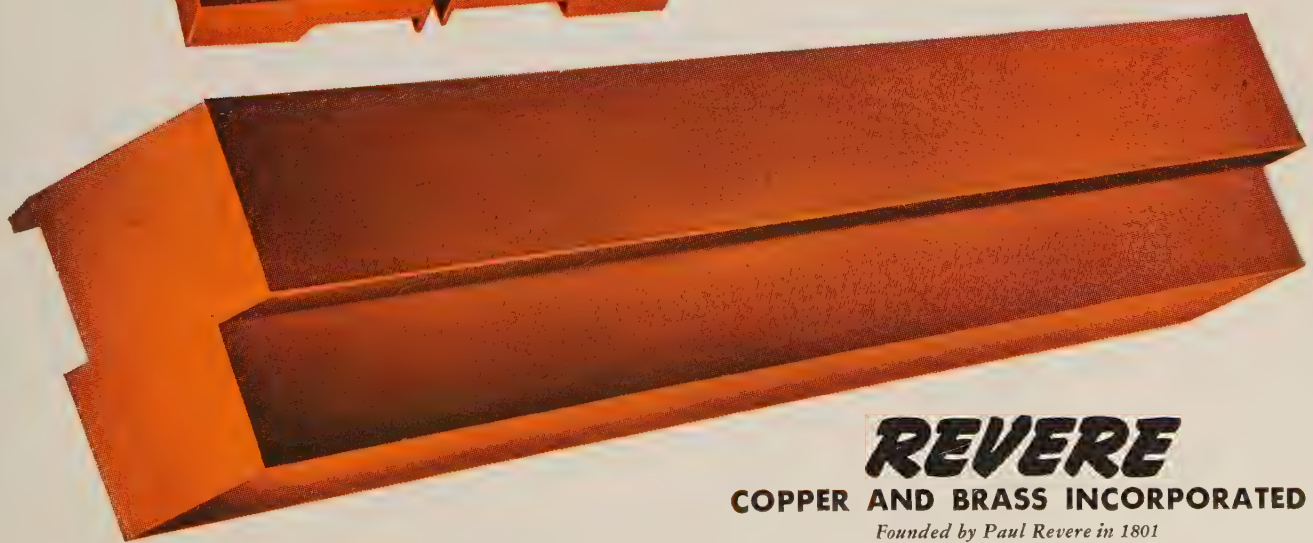
SAVES

26% FOR TOCCO

Here is a "fishtail" and the Revere Copper Shape from which it is made. The part is a terminal block on a high frequency transformer, used in induction heating apparatus made by the Tocco Division of the Ohio Crankshaft Co., Cleveland, Ohio. Tocco is an important supplier of induction heating equipment to industry, which uses it for such diverse jobs as heat-treating and hardening, brazing, soldering, removal of gases from metal parts of vacuum tubes, vacuum casting, and heating before forging, upsetting, or other hot working.

The "fishtail" formerly was machined from solid copper bar, and on a typical run, the total cost for a certain number of pieces was $35,000. Revere studied the part with Tocco, and suggested that a shape would save money, even though the plain bar cost 10 cents less per pound. Actual experience produced these figures: total cost on the same number of fishtails, $25,700, a saving of $9,300, or 26.6%.

If your shop is machining plain rod or bar, it might pay you to consider the advantages of extruded shapes. Revere produces them in copper and its alloys, and aluminum alloys. Many design details can be preformed for you, provided they are parallel to the axis of extrusion. Revere would be glad to collaborate with you and see if shapes cannot save you money. See the nearest Revere Sales Office.



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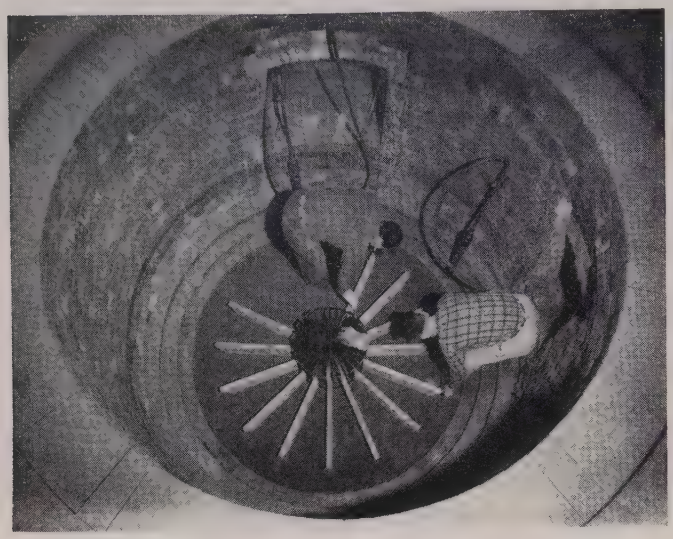


Workmen position 2 x 6-in. spokes around the hub after flat has been rammed in. Centering the hub is vital

Next, 1 x 6-in. facing boards are tacked into place to box the form for the first level of ramming mix

Shortcut to Better Hearths

That's the report from arc furnace operators who have used a new, bottom-ramming form. Steel hub simplifies job and improves the density of side banks

INSTALLATION of rammed hearths in electric furnaces no longer has to be a tedious, time-consuming job. A steel hub form offered to arc furnace operators by Basic Refractories Inc., Cleveland, takes the drudgery out of the task and produces a monolithic structure that leaves more usable hearth area.

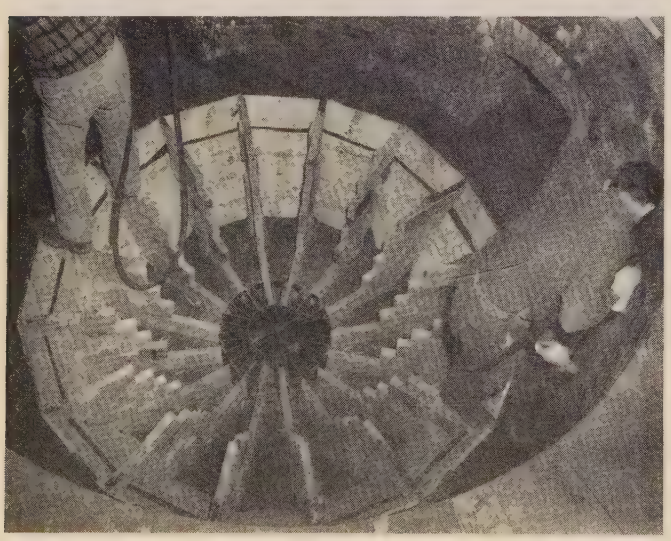
Ramming is done vertically in back of the form, giving greater uniformity and density to the banks. Thickness and slope of the banks may be closely controlled to the contour best suited to the steelmaking needs.

Here's How—The accompanying illustrations show construction of a hearth in a 20-ton furnace at Ohio Steel Foundry Co., Lima, O. The entire job took only 6¾-hours and required 9 tons of ramming mix. Basic supplied the supervision, and the foundry supplied four laborers, a carpenter and a carpenter's helper.

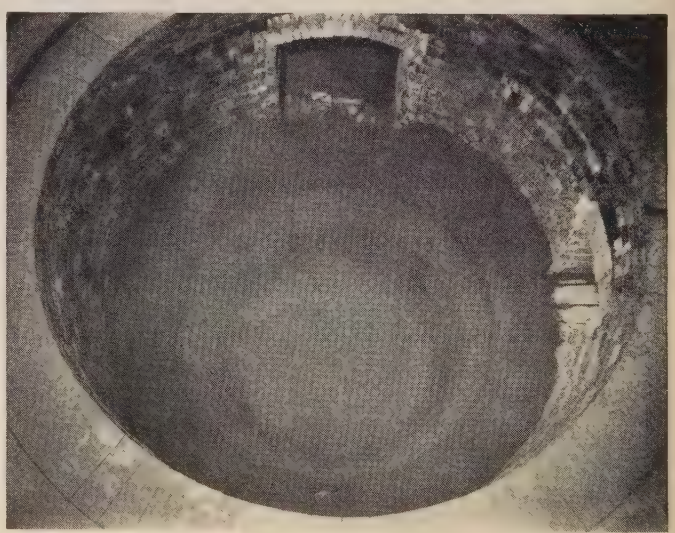
First, the bottom flat is rammed into place. This done, the steel hub form is centered on the flat and 2 x 6-in. boards are fitted to it in spokelike fashion. Ends of the 2 x 6s are cut to the angle required for proper bank slope, and a facing of 1 x 6-in. boards tacked to the ends makes up the first level of the 16-sided form.

Slope Variations—For some installations it may be desirable to vary the bank slope or thickness in some areas of the hearth. By changing the length of some of the 2 x 6 spokes and/or the angle at which the ends of these brace members are cut, just about any form contour can be achieved.

Ability to establish bank slopes precisely is particularly helpful in



Workmen are tamping in the top layer of mix. In bigger furnaces, decking could be provided for work platform



Note monolithic lines of finished job. It took only 6¾-hours to complete the hearth

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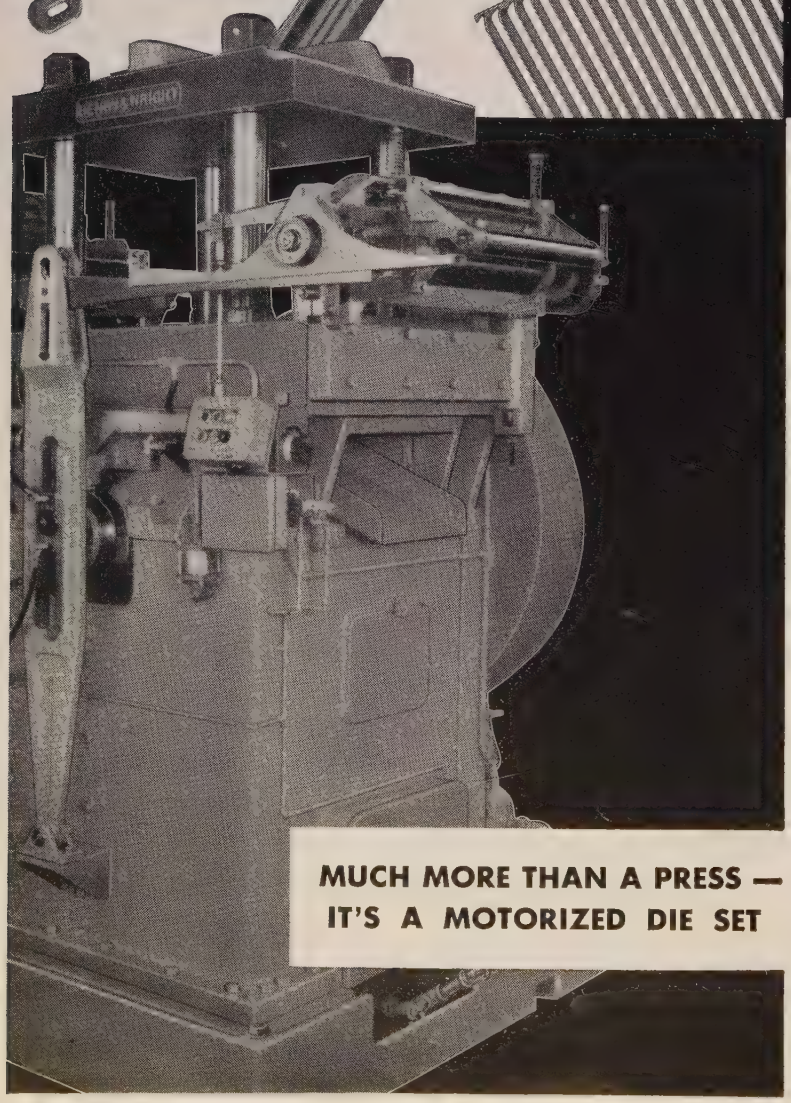

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the tap-hole section. Depending on the height of the tap hole and the maximum pouring angle of the furnace, it may be desirable to bring the base of the back toward the center of the furnace and flatten out the slopes. Proper design will insure complete furnace drainage.

Next Round—The ramming mix is shoveled into the space between the form and the brickwork and compacted by vertical ramming up to the top of the facing boards. The next set of 2 x 6 spokes is joined to the bottom layer with 1 x 4-in. scab boards. These spokes can either be short as shown in the photos, or long enough to brace against the hub for added strength in large furnace installations.

Use of longer 2 x 6s has another advantage. A decking can be laid over the hub and spokes, providing a good working platform.

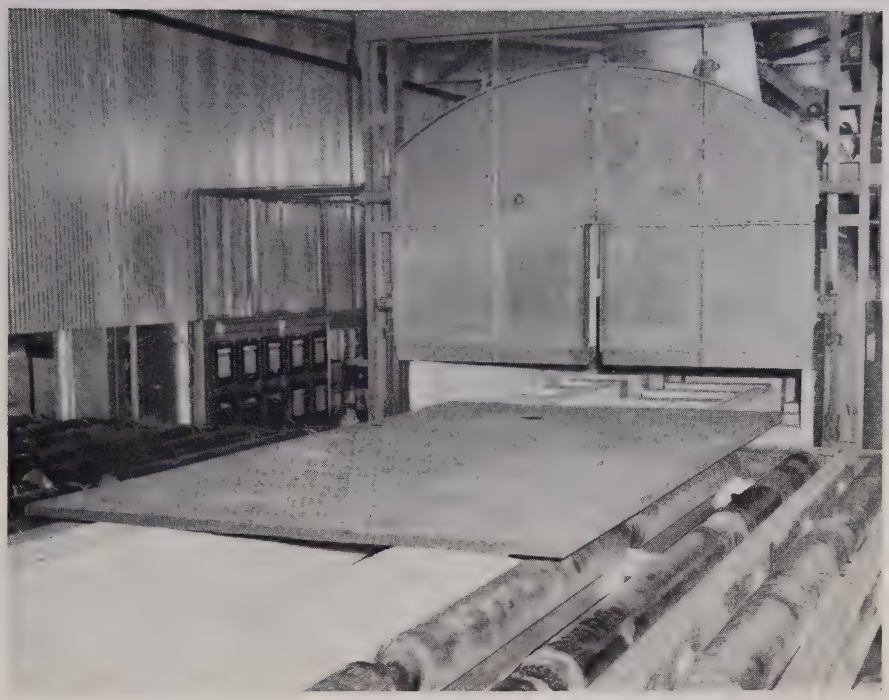
Finishing Up—After the facing boards are added, the next layer of mix is rammed in place. This cycle continues until either the desired height is reached or lack of clearance makes further use of forms impractical. In the latter event, tamping above the forms should be done with the rammer as near vertical as possible.

In the Ohio Foundry furnace, banks were rammed five boards high and carried to a feather edge about 4 in. above the last form board. The furnace was ready for use immediately after the lumber and steel hub were removed.

Basic Refractories credits personnel at the Canton, O., plant of Republic Steel for many of the suggestions that have perfected the system. The technique was first tried out on one of Republic's furnaces.

Correction

AJAX Engineering Corp., Trenton, N. J., wishes to correct a temperature figure which was given in its advertisement in STEEL, Apr. 4. The statement was made that the temperature of the melt is held at 870° F. This should have been 1170° F.



This may look like ordinary clad-steel plate, but . . .

Brazing Does the Cladding

FIVE YEARS of intensive research in vacuum metallurgy has produced a new material for clad metal users. The big difference: Highly uniform cladding thickness and an almost infinite choice of cladding metals.

Chicago Bridge & Iron Co., a big user of clad plates for fabricating tanks, Hortonspheres and other vessels for specialized service, developed the product at its Birmingham, Ala. plant. Called Hortonclad, it will be made available to other industrial users.

How It's Made—Chicago Bridge starts with the base plate cut to predetermined size. Braze metal is applied and the cladding metal is positioned. With special equipment, the assembly is heated while pressure is exerted on the exterior surfaces. A high vacuum is maintained between the two metals.

Since no rolling is required, the thickness of the cladding is uniform. Aside from joining the two plates, the brazing material serves as a barrier. It prevents carbon migration from the base plate to the clad surface.

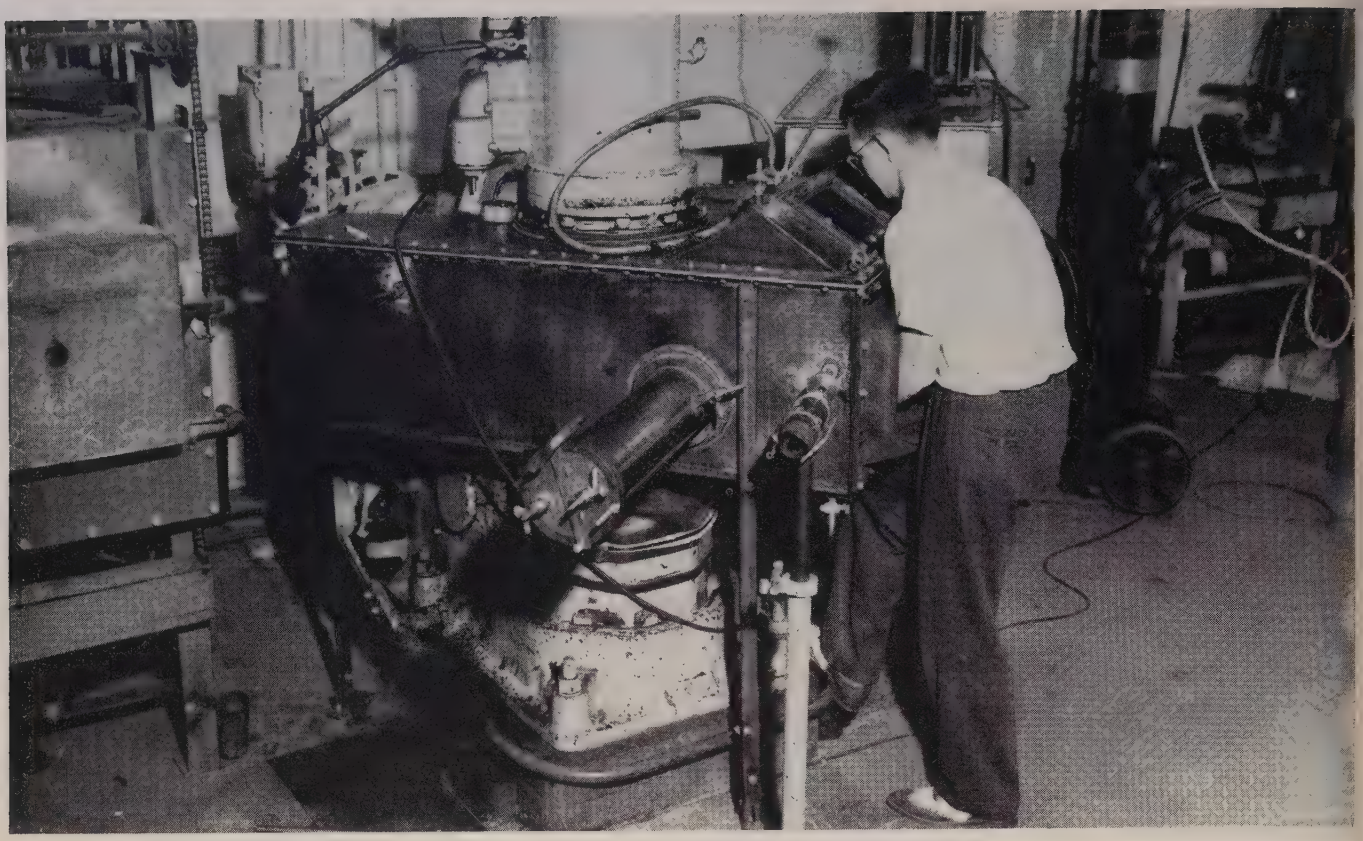
Material is available in steel alloys, such as chromium, chromium-nickel and nickel alloys, Monel, Inconel. Some specials already produced are Hastelloy B, C and F clad to carbon steel, and fine silver clad to stainless steel. Additional combinations are under development.

Meets Codes—All requirements of the ASME Boiler code and the API-ASME Unfired Pressure Vessel code on composite clad materials are met. Nickel-base-alloy Hortonclad meeting ASTM material specifications A-263, A-264 and A-265 has been produced.

The entire thickness of the composite metal can be utilized in design computations.

Easily Fabricated—The braze-clad material can be worked readily by usual methods, such as rolling, bending, welding and pressing. Proof of its ability to withstand shop fabricating methods is the number of vessels with ellipsoidal and hemispherical heads already built. They have complied with all code requirements.

The vessels have withstood severe corrosion conditions in the chemical, petroleum and paper industries for several years. In some processes the temperature cycle ranges from ambient to 900°F. The Hortonclad has shown no ill effects.



Working at the experimental inert gas forge. Behind the operator's head is the gas-tight chamber containing the induction furnace

Inert Gas Extends Forging Limits

SURROUNDED BY inert gas, an "unforgeable" titanium alloy has been forged. Under the same atmosphere, and without surface oxidation, molybdenum and tungsten alloys have been forged. Here's how it is done at the research laboratory of General Electric Co., Schenectady, N. Y.

An induction furnace and the die-and-anvil area of an air hammer are enclosed in gas-tight metal boxes. Rubber bellows connect them and seal them to the hammer. The chamber is filled with welding-grade argon under low pressure.

Windows let the operator see what is going on. He manipulates specimens under the hammer with rubber gloves that form part of the gas seal.

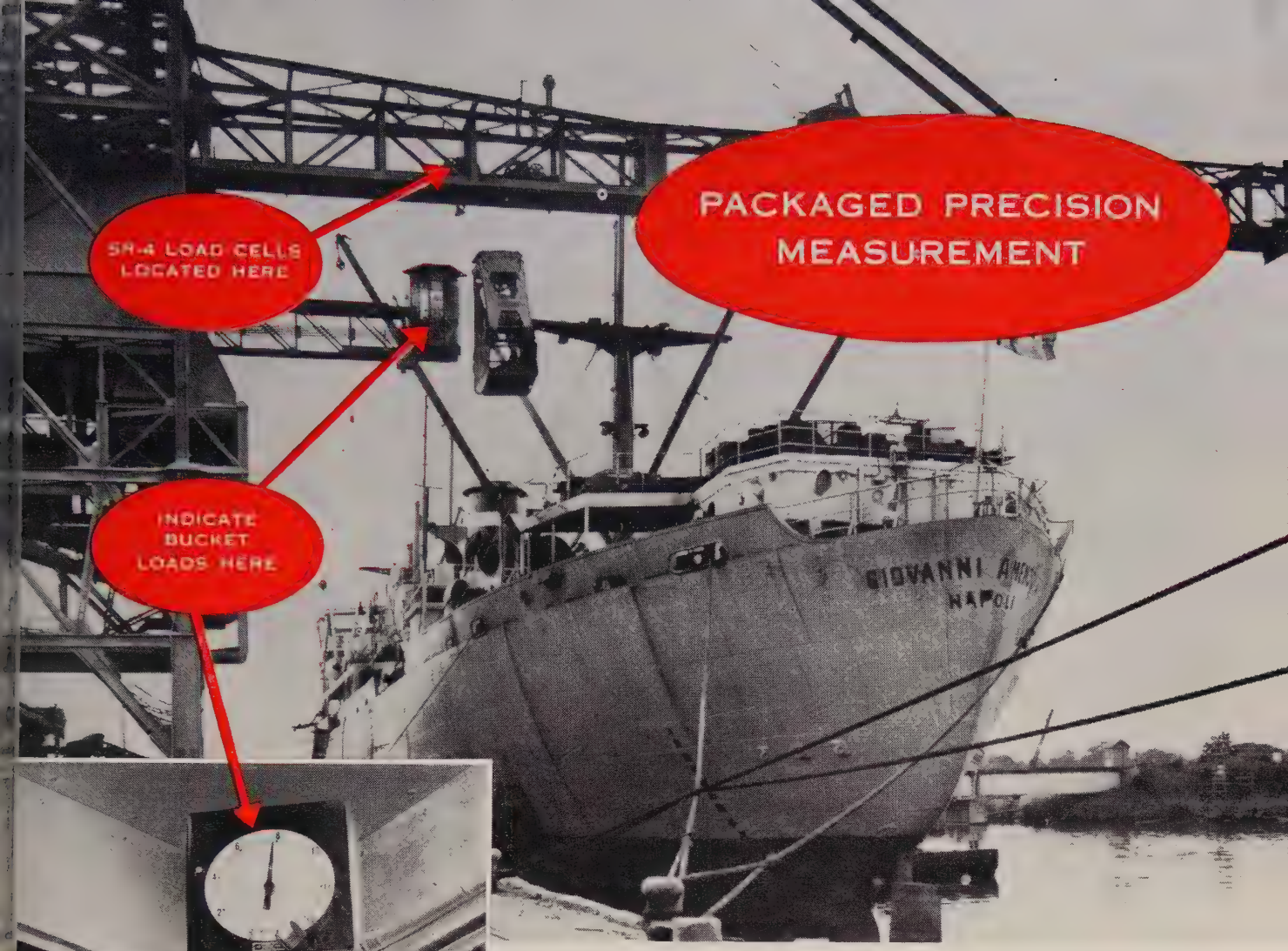
For Tough Ones—This unusual installation was constructed for experimental work on problem children like pure beryllium, titanium, zirconium and uranium—they oxidize and scale heavily when worked in air. High-temperature forging of refractory materials is being tried, too, with good results.

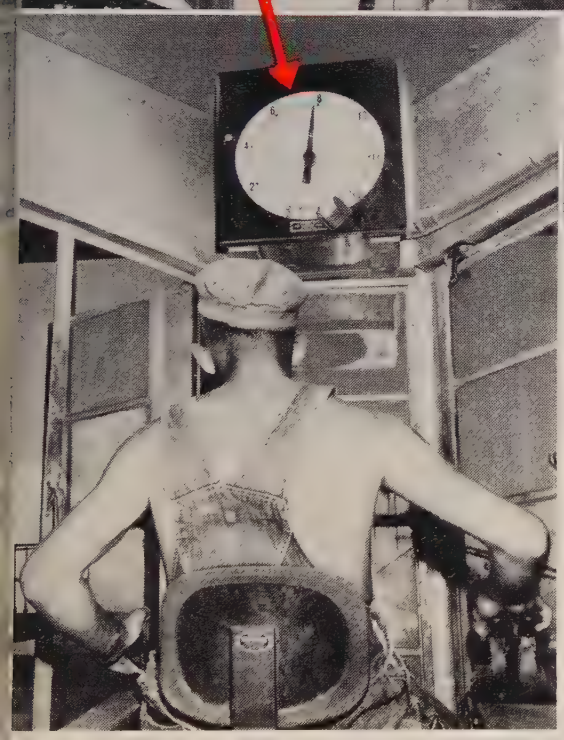
Arc-cast pure molybdenum was reduced in the forge to test-specimen size at 3230°F without difficulty. (Temperatures given here are maximums, some dropping as much as 700 degrees during working.) Specimens of a molybdenum alloy (Mo, 2.66 Ti, 0.084 C) were reduced from ½-in. square to ¼-in. square in one heat at starting temperatures of 3180, 3325 and 3490°F. Specimens lost up to 5 per cent in weight, but their bright surfaces indicated this was due to small pieces breaking off rather than to oxidation.

More Tough Ones—A molybdenum-vanadium alloy (Mo, 0.85 V) forged well at 3485°F; at 3270°F, some edge cracking occurred. After initial forging, some of this alloy was reduced to 0.125-in. wire which did not fracture after a 180-degree bend. When this alloy was forged in air between 3300 and 3600°F, it showed a 12-percent oxidation loss, although tensile tests showed no appreciable difference between the gas-forged and air-forged specimens.

A tungsten alloy (W, 30 Mo, 1.5 Th) was forged from a 0.315-in.-square bar to a strip 0.07 in. thick x 1.25 in. wide. An arc-cast button of a titanium alloy which could not be forged in air was forged at 2735°F in argon. Reduction was from 0.25 in. to 0.06 in. Only evidence of oxidation was slight discoloration.

Practical?—Although this forge is a laboratory tool, Carl L. Kolbe, of the G. E. Research Laboratory, sees no reason why the technique can't be adapted to production work if the need arises. He suggests for production: Enclose the entire forge and furnace in a gas-tight box.





Baldwin SR-4 System indicates and continuously totalizes ore loads in the crane cab (above). The operator has a continual check on the load being carried by the clamshell.

At Alabama State Docks this Heyl & Patterson crane . . .

unloads ore faster by using SR-4® automatic weighing system

Baldwin's "Packaged Precision Measurement" can cut your ore handling costs. That's been proved at the Alabama State Docks, Mobile, Alabama. There a Heyl & Patterson unloading crane is using Baldwin SR-4 load cells and recorder to weigh electrically clamshell buckets of ore.

This Baldwin SR-4 automatic weighing system benefits this user three ways:

1. **Faster handling:** The bucket does not have to be stopped to determine weight since its weight is being continuously measured by two 20,000 pound load cells in the sheave block. More ore can be handled by the unloading equipment each shift, reducing handling costs.
2. **Easy operation:** A large indicator dial in front of the operator tells him when to add the weight on the totalizing counter. The indicator totalized the weights measured by two distant SR-4 Load Cells and zeroes out all but net weight of ore.
3. **Low maintenance:** SR-4 Load Cells have no moving parts to wear out. They are sealed against air-borne dust. They are giving accurate, dependable service.

Baldwin SR-4 Load Cells can solve your weighing and force-measuring problems. Write for our *new* Bulletin 4301. It's loaded with detailed information on typical applications and instrumentation for these unique devices. It tells you how to use them for local or remote indication, recording, signaling or process control. Use coupon today!

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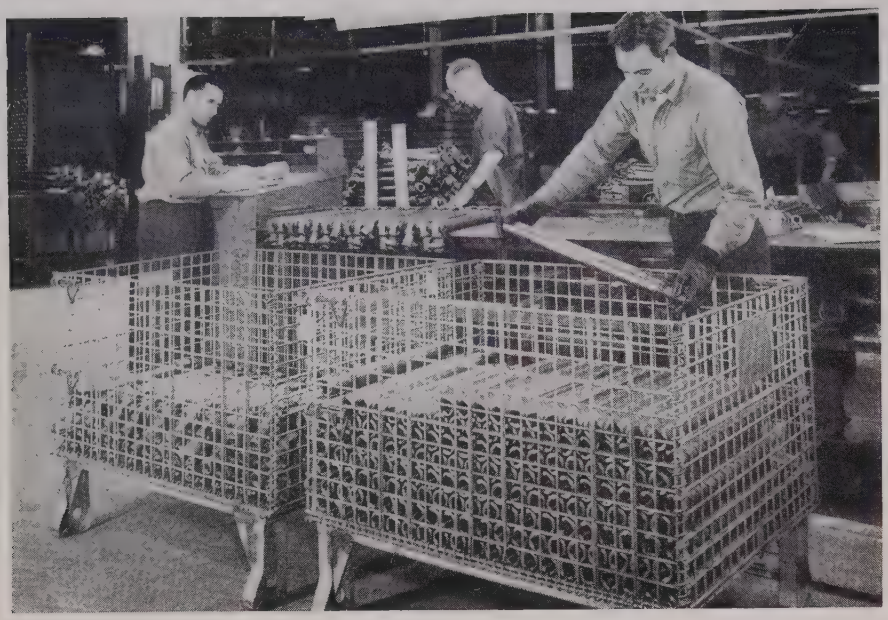


Universal joints are loaded into Cargotainers for shipment

More Trips from Wire Containers

BY SHIPPING its products in wire mesh containers, Blood Bros. Division of Rockwell Spring & Axle Co., Allegan, Mich., is saving 89 per cent on container costs. And it has improved customer service.

A major supplier of universal joints for farm equipment manufacturers, the company formerly shipped in wooden skid boxes.

Where Are Savings?—Wooden containers were good for about five trips. Blood Bros. gets over 25 trips out of the wire containers. Fewer nonreturns and fewer losses through damage in shipment mean fewer containers needed to do the job. Repair costs are reduced.

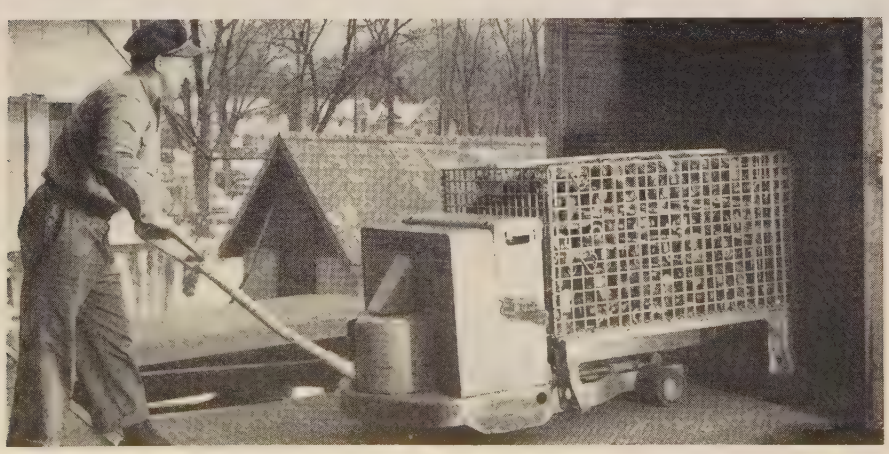
Return of empty skid boxes by common carrier requires first-class rate. Return of folded wire mesh containers take a fourth-class rate throughout most of the company's market area.

Other Benefits—The containers are saving customers $3035.02 a year. The company charges cost of the containers to the customer. On their return, the amount is credited to his account. In 1952, about 29 per cent of the boxes were not returned.

Shipments are easier to unload, and there is less damage en route. Containers can be folded while awaiting shipment to save space in storage. Inventory is simple because stock is visible.

The wire mesh containers, called Cargotainers, are made by Pittsburgh Steel Products Co., Pittsburgh. They have 4000-lb capacity.

Cargotainers are handled easily with platform trucks



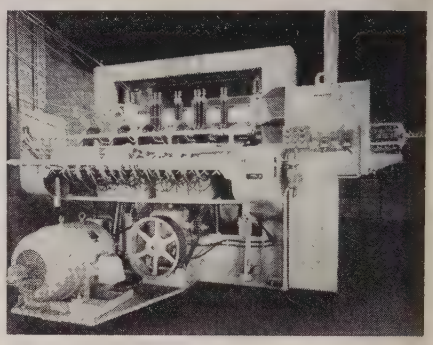
For a Smoother Ride

Welder turns wire into auto seat springs and cuts formed mat to size

ONE LINE of 1955 automobiles is "sitting prettier" because of a new welding machine which turns wire into auto seat springs automatically.

One of eight developed by United Welders Inc., Bay City, Mich., the machine welds wire fed from coiled stock and cuts the formed mat to proper size.

Capacity—Sixteen strands of wire feed into the front of the machine and a single strand feeds from the right. Seven miles of wire an hour are consumed when the welder is in full operation.



SPRING WELDING MACHINE
. . . uses 7 miles of wire an hour

Operating parts are driven by a 50-hp motor, which is V-belted at a 4:1 reduction to a Cone-Drive speed reducer. Made by Michigan Tool Co., Detroit, the reducer has a 5:1 reduction ratio. Chains from the reducer transfer power to the main driveshaft, which, in turn, actuates the welding ram, indexing platen and wire feed.

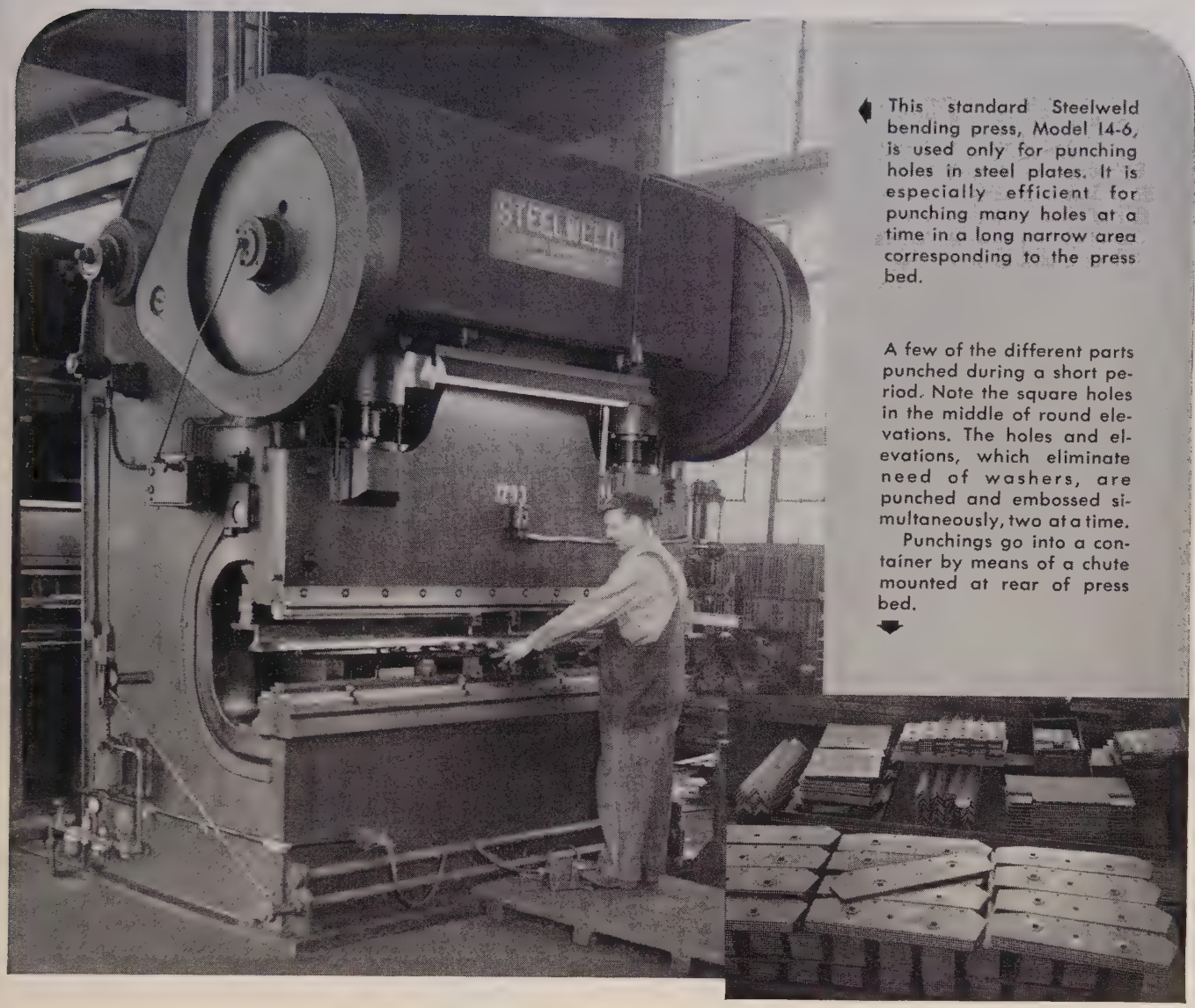
The wire welder measures 22 ft long x 14 ft wide x 9 ft high and weighs about 60,000 lb.

Weld-It-Yourself

Projects in Metal for the Home and School Shop contains details for making 78 home projects in steel. Projects include such things as: Stair railing, lawn furniture, wrought iron work and shop tools.

Copies of the book may be had for 50 cents by writing the James F. Lincoln Arc Welding Foundation, 22801 St. Clair, Cleveland 17, O. Copies to be mailed outside the United States are 75 cents.

Press Brake Used Solely For Multiple Punching



This standard Steelweld bending press, Model 14-6, is used only for punching holes in steel plates. It is especially efficient for punching many holes at a time in a long narrow area corresponding to the press bed.

A few of the different parts punched during a short period. Note the square holes in the middle of round elevations. The holes and elevations, which eliminate need of washers, are punched and embossed simultaneously, two at a time.

Punchings go into a container by means of a chute mounted at rear of press bed.

BENDING BRAKES are not always used for bending. Here is one that is used solely for multiple-punching work. It is on its 12th year of continuous operation, punching holes of various sizes and numbers.

While other Steelweld presses in the plant where this machine is located handle many bending and forming operations, any Steelweld can be quickly switched from one form of work to another and thus take care of a wide variety of jobs: bending, forming, multiple-punching, blanking, etc.

Steelweld Bending Presses are versatile, heavily-built tools designed for quick set-up, easy operation and long trouble-free performance. Hundreds of these machines are serving every segment of the metal-working industry. If you need a press brake, you will be happy with a tried and proven Steelweld.

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CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

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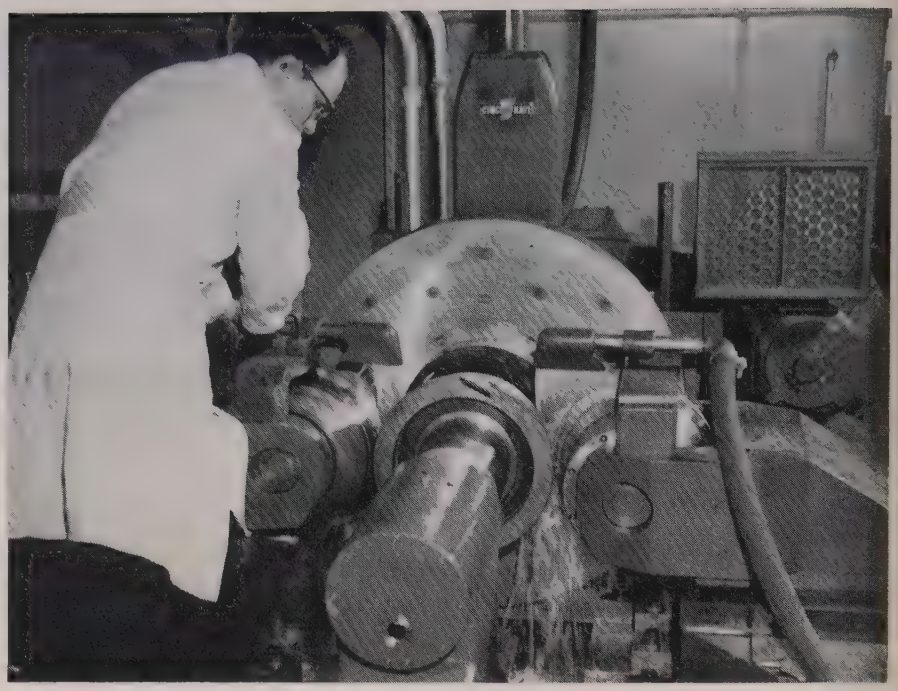
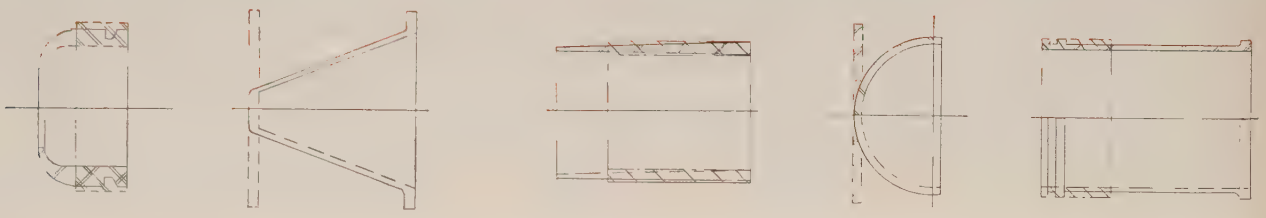
A new machine tool roll forms cold ¾-in. stainless steel. It means increased production, lower costs and greater resistance to fatigue failure



Here is the Hydrospin in operation. The two steel rollers force the disc into a conical or contoured shape over a rotating mandrel while two streams of coolant spray the work area

Contours Cold Flow Into



PRODUCTION COSTS of many difficult-to-form aircraft components at Solar Aircraft Co., San Diego, Calif., will be cut in half by the use of a new machine tool that roll forms cold alloy steels.

Known as Hydrospin, the unit is the first of its type to embody semiautomatic features in producing contoured shapes. Once adjustments are set by an operator, various steps in the work cycle proceed automatically, except for loading and unloading.

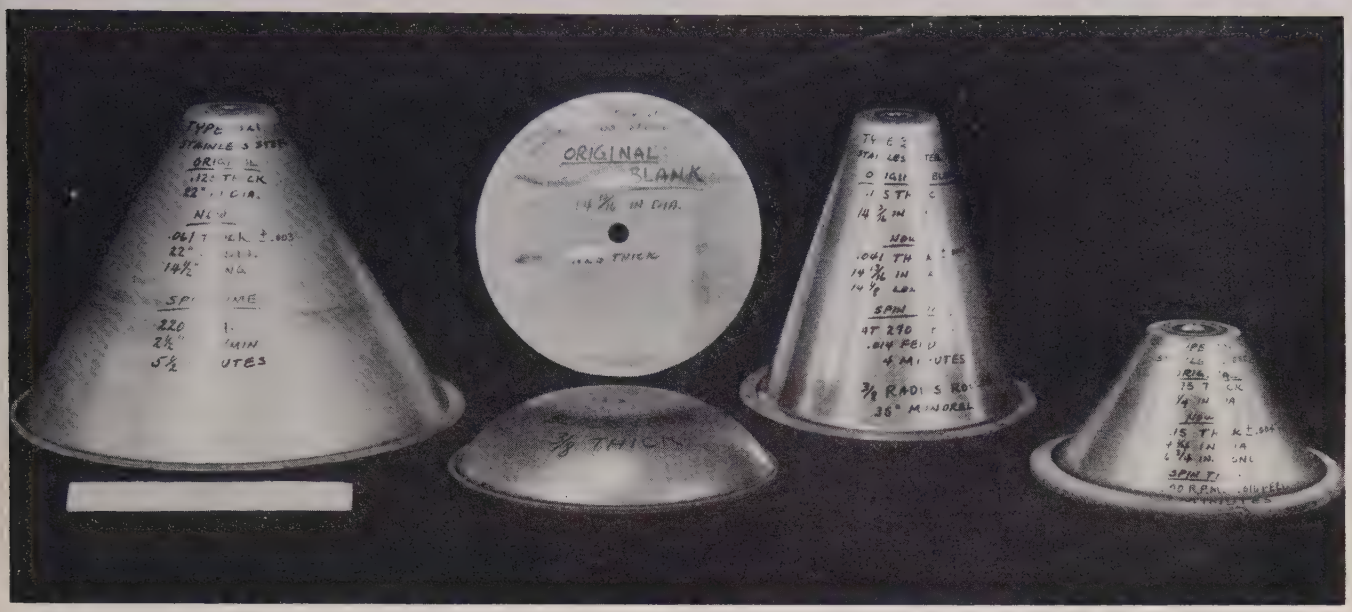
Operation—Working parts of the machine are two opposed steel rollers and a rotating mandrel which is machined to the shape of the desired internal diameter. The rollers force a metal disc rotating at high speed to cold flow onto the mandrel as they advance along a preset course. Pressure comes from four, 25-ton hydraulic cylinders (two operate at 2000 psi, two operate at 1000 psi).

In hydrospinning, the diameter of the blank is the same as that of the finished part. Metal is displaced into the extended area. It undergoes a shear deformation, greatly elongating the grain structure, which results in work hardening of the metal and an increase in tensile strength. This gives hydrospun parts a greater resistance to fatigue failure than components made by conventional methods.

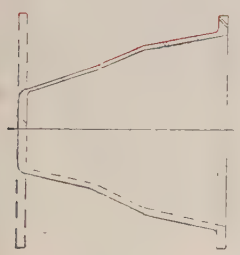
Capacity—Stock up to 42 in. in diameter can be handled. The machine has successfully formed 1-in.-thick mild steels and ¾-in.-thick stainless steel. At Solar, a 5-ton bridge crane services the machine.

The company will use it to make jet engine and other high-temperature parts. On jet exhaust cones many forming, welding and machining operations can be eliminated by hydrospinning. Another part is now made from a hemispherical casting, with additional machining and welding, at a total cost of $40. On the Hydrospin, the entire

Some of the shapes Solar has spun on the new machine tool



Shape



cost would be approximately $15.

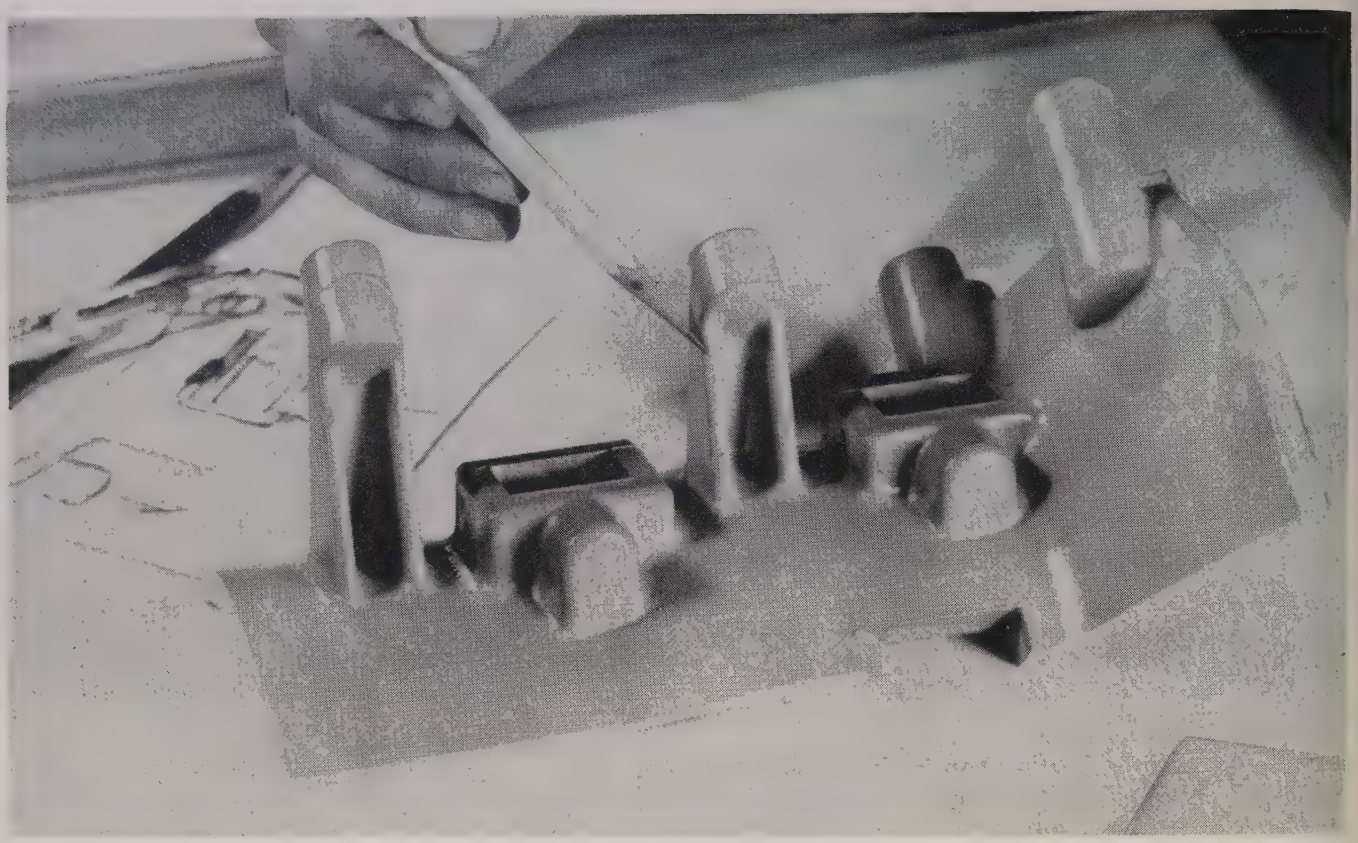
A Major Use—In the past, at Solar, dome-shaped, contoured parts have been fabricated in two sections and welded together. This requires special dies and fixtures. On the new machine, they are simply formed from a blank disc. In many cases, only one-fourth as much material is required to hydrospin the part as to produce it from a forging. Production time is less, too.

The machine, made by Cincinnati Milling Machine Co., is valued at $100,000. It weighs 32 tons and required two freight cars to ship it to Solar's plant.

Typical Application

This turbo hood flange of 321 stainless steel starts as a bar ⅝-in. x 2 in. x 41.43 in. long (top). It is rolled to a 12⅜-in. ID and butt-welded (left). After sizing, annealing and sandblasting, it is faced on both sides and machined inside and out. The final bore must be held to 12.510 in., +0.0015, —0.00. A locking ring groove, used to clamp the part to the mandrel of the machine, is cut on a lathe. The contour (right), including the upper groove, is spun on the Hydrospin.

The final part has a wall section (far right) ranging from the original ⅝-in. down to 0.125 in. at the spun end. The internal diameter remains 12.510 and the over-all height becomes about 3 in. This part in the past cost about $48 to produce. Solar expects the cost to be cut to less than half with hydrospinning. It will also be easier to maintain tolerances and avoid rejects. Solar engineers have developed a spring-loaded retaining ring to hold the part on the mandrel and eliminate the machining of the locking ring groove. It will be used in production.



Holes, thin sections, small radii hold an even coat of porcelain enamel on this aluminum test casting

Aluminum Castings Get a Glassy Coat

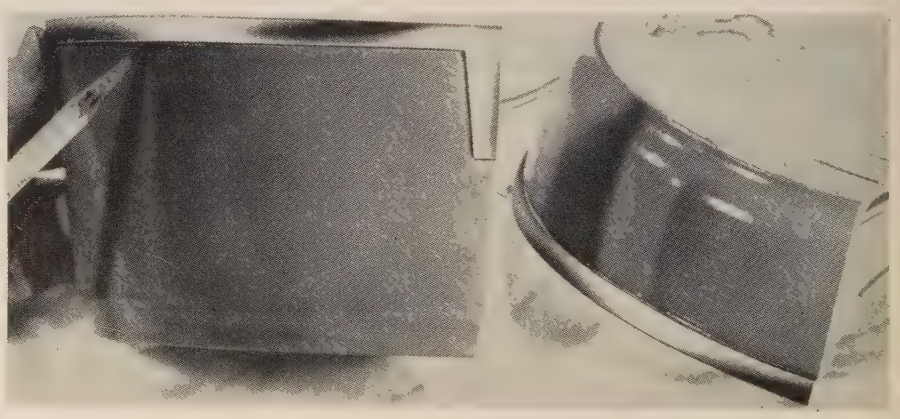
DON'T BE SURPRISED if the next small appliance you buy combines the appeal of porcelain enamel with the light weight of aluminum.

Aluminum castings with a porcelain enamel finish are here. Probably their first use will be in table appliances — mixer bases, waffle irons, electric frying pans.

Monarch Aluminum Mfg. Co., Cleveland, is the first to announce a successful process for castings. (Porcelain enamel has been available on aluminum sheet for about five years.) Monarch is prepared to go ahead with volume production, and is looking for applications where the coating will be popular. Typical application in the works: a washing-machine agitator with a surface as colorful and shiny as the surface of the tub.

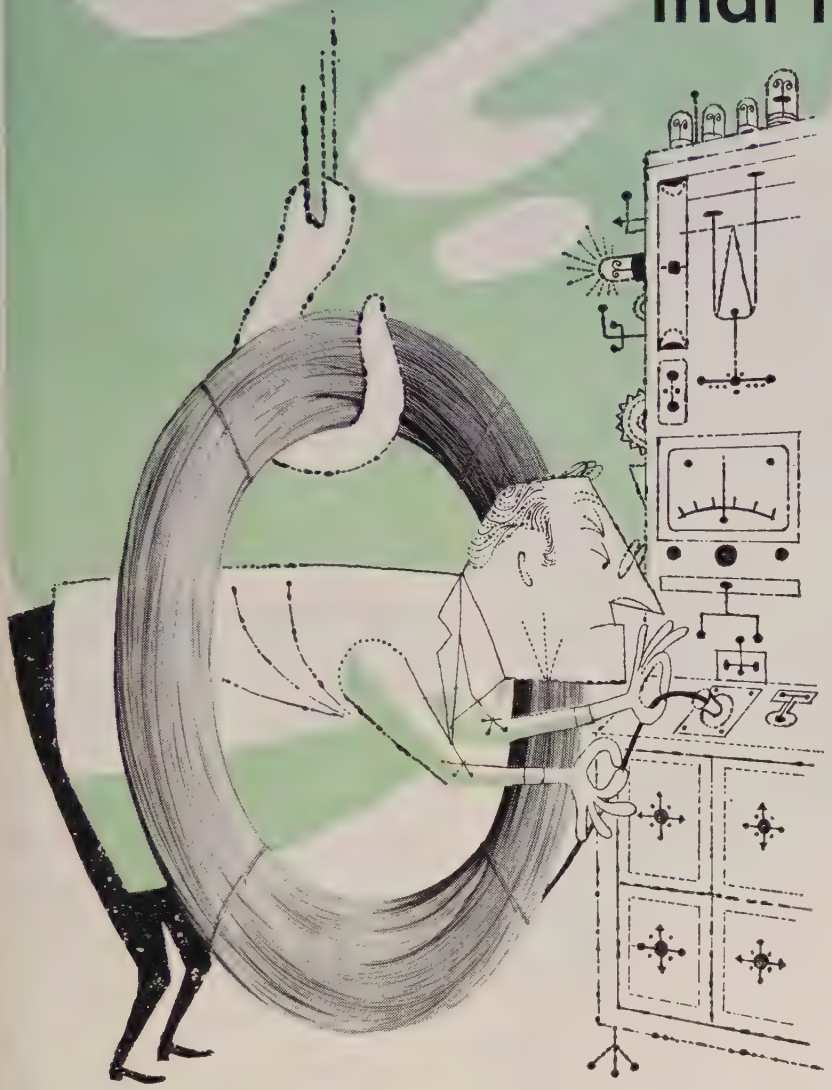
Color Appeal—Color should be a big sales point. Those available are light fast. They resist fading and discoloration on exposure to detergents, salt water, mild alkalies and acids. Monarch recommends combining the enamel with areas of natural aluminum to enhance the beauty of both.

Surface protection is another strong point. The low-temperature frits used can't equal the abrasion resistance of frits used on steel, but they give a surface film ten times tougher than normal alkyd-amine paint. The surface cleans easily and is highly



Section of a cast cooking vessel with decorative enamel applied to the outside wall below a decorative bright metal edge

Do you design machinery that fabricates wire?



The design of Wire Fabricating machinery is one of the most rigorous engineering assignments you can get. But no matter how tricky the problems, do not forget the front end of the machine—where you actually load the wire.

We have been amazed, for example, to learn that certain customers have been buying non-standard coils of wire for years, thinking that they were *standard* coils. Naturally, there is a shipping delay due to not being able to use standard material.

Here's an offer: If you contemplate the design of any wire fabricating equipment, get in touch with your American Steel & Wire representative first. Let him bring you up to date on the latest wire industry standards—and show you how to design the equipment to use the most economical types and sizes of wire coils. He will also be glad to help you lay out your wire storage and handling facilities. The result will be lower costs and faster delivery and better production using your newly designed equipment.

USS AMERICAN MANUFACTURERS WIRE

AMERICAN MANUFACTURERS WIRE

AMERFINE—*High quality fine wire.*

AMERSPRING—*music steel spring wire.*

AMERLOY—*alloy heading wire.*

AMERTEMP—*heavy-duty oil-tempered wire.*

AMERHEAD—*uniform heading wire.*

AMERSTITCH—*extra-tough metal stitching wire*

USS TRADE MARK

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

FOR ECONOMY IN MANY SEVERE SERVICES . . . it's hard to beat Shenango centrifugally cast parts of Meehanite Metal. These assembled rolls with steel journals are typical, long-lived examples. The combination of Shenango centrifugal casting and Meehanite Metal means pressure-dense grain for a smoother finish, less waste, greater strength and superior wear resistance. Porosity, sand inclusions, blow holes and other troublesome defects are a problem of the past. For informative bulletins on Shenango centrifugally cast parts—rough, semi- or finish-machined, ferrous or non-ferrous — write to: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (Executive Offices: Pittsburgh, Pa.).
SHENANGO
CENTRIFUGAL CASTINGS
COPPER, TIN, LEAD, ZINC BRONZES • MONEL METAL
ALUMINUM AND MANGANESE BRONZES • NI-RESIST • MEEHANITE® METAL

resistant to spalling and chipping.

Kitchenware — Ability to stand cooking temperatures without chipping, flaking or discoloration makes the enamel look like a natural for decorating cast aluminum kitchenware. Caution: As of now, Monarch won't recommend it for surfaces in contact with food because the enamel has a lead borosilicate base. Research in progress may show it isn't toxic, but the company is playing it safe.

Look for enamel to be used also for its thermal insulating value. It's a good insulator, and aluminum is a good conductor of heat, a combination which offers interesting design possibilities. One proposed is a heater with cast-in heating element. A polished aluminum surface would radiate the heat, enameled surfaces would confine and reflect it.

Versatile—The coating can be applied over as-cast or polished surfaces—Monarch is using it

Cast-in heating element is backed up by a reflective surface of enamel for thermal insulation. Sawed edges show no chipping

mainly on permanent mold castings, but engineers there think the process can be adapted without undue difficulty to diecastings.

Complicated castings don't seem to make much difference. The enamel maintains uniform thickness in holes, on thin sections and around small radii. It is now being applied by spraying.

Even machining after firing is possible. The enamel can be drilled or sawed without chipping; bare aluminum areas can be welded without disturbing the adjacent coating.

NEW PRODUCTS and equipment

Write directly to the company for more information

Centerless Grinding Machine

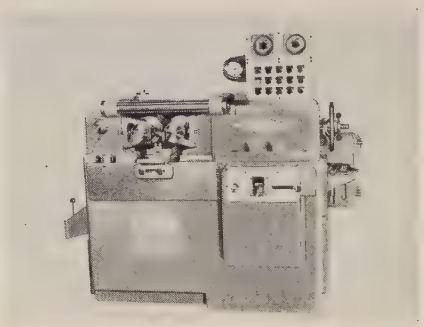
The Cincinnati Filmatic No. 0 is a small, general-purpose machine suitable for grinding a wide range of metallic or nonmetallic parts up to ½-in. in diameter. It is recommended for rapid, accurate production of small drills, pins, punches, shafts, clock parts, instrument parts, etc.

Outstanding features include multiple bearing segments which support the spindle accurately and rigidly on high-pressure, wedge-shaped oil films. Lubrication is automatic and positive. An automatic cut-out stops the spindle drive motor on lubrication failure. Hydraulic operation of the grinding wheel truing device minimizes diamond wear.

Regulating wheel spindle speeds are indicated by a tachometer. Its dial, used with the single handwheel control, simplifies the changing of regulating wheel speeds.

Drive is by wide V-belts and variable-pitch sheaves. The final drive to the regulating wheel spindle is by worm and worm wheel. Cincinnati Grinders Inc., Cincinnati 9, O. Redwood 2121

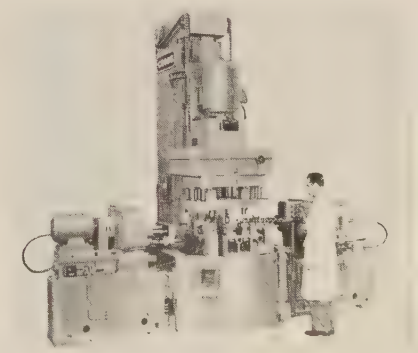
Thread Rolling Machine



The two, thread-roll dies are mounted on power-driven, parallel, horizontal spindles. One roll and its spindle rotate in a stationary bearing support. The opposing roll and spindle unit rotate in a movable bearing support housing controlled by variable hydraulic pressure. The machine is powered by a 7½-constant-horsepower, two-speed motor with V-belt to the speed-change gear box. Splined driveshafts and heavy-duty, universal joints connect the speed-change gear unit with the final drive mechanism in the spindle housing. Four pairs of change gears provide 16 spindle speeds, ranging from 14 to 126 rpm. Higher speeds for special uses are available.

The pushbutton control panel is mounted at eye level. This panel is equipped with switches and indicator lights for operating the machine on any desired cycle including manual, semiautomatic and fully automatic (see p. 100). Landis Machine Co., Waynesboro, Pa. Waynesboro 222

Special Machine Tool



Air compressor cylinder blocks are drilled, chamfered and reamed at the rate of 144 pieces per hour by this tool. It is a dial-type, with four stations—one for loading, three for drilling, chamfering and reaming.

The work cycle is automatic, with a fluid motor drive for indexing. Two similar parts are handled by a two-position, progressive-type, work-holding fixture. Standard and special parts are interchangeable. Other features include hydraulic feed and rapid traverse, hardened and ground ways. Construction is to JIC standards. Cross Co., Detroit 7, Mich. Walnut 1-3000

BLAST FURNACE

Designed and built by Arthur G. McKee & Company

IN THE COURSE of fifty years of engineering and construction for the Iron and Steel Industry, McKee has completed sixty-four new blast furnaces and rebuilt fifty others.

The performance of these furnaces can be judged best by their consistently long campaigns, particularly in the high-production period during and since World War II. Another indication of their performance is the fact that all but one of the modern records for one month's pig-iron production, including the present record, were made in furnaces of McKee design.

The most recently completed McKee-built furnace, shown on the opposite page, is the largest merchant iron blast furnace in the world.

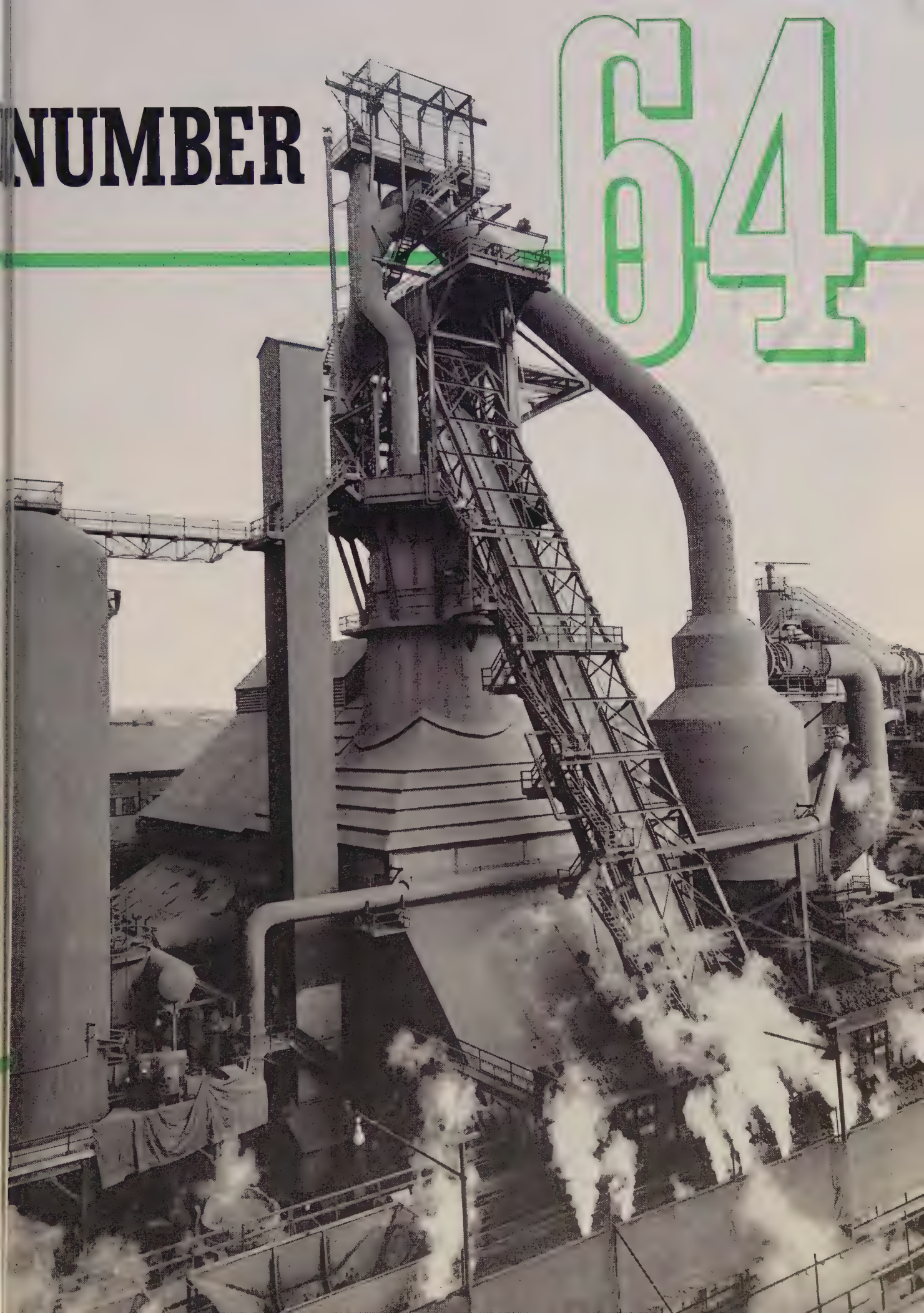
50th ANNIVERSARY

McKee Engineering Services

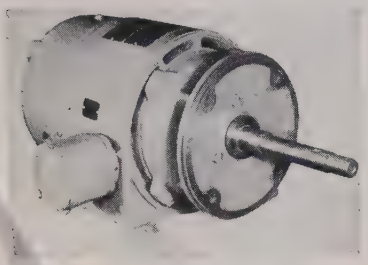
Arthur G. McKee & Company • Engineers and Contractors

Headquarters: McKee Building • 2300 Chester Avenue • Cleveland 1, Ohio
Offices: New York • Tulsa, Oklahoma • Union, N. J. • Washington, D. C.
British Representatives of Metals Division: Head, Wrightson & Co., Limited
Canada: Arthur G. McKee & Company of Canada, Ltd., 372 Bay St., Toronto

NUMBER 64



Close-Coupled Pump Motor



They are for use (with centrifugal pumps) in dangerous, damp or dusty locations, and are available in ranges from 1½ to 25 hp. Special features include a face-type registered-mounting bracket for accurate shaft alignment and a simplified pump mounting. The shaft is precision ground for accurate pump impeller mounting. Solid flange and slinger provide complete liquid deflection.

Larger motors are double enclosed and fan ventilated for rapid heat dissipation. Small motors are self-cooled by radiation. Certified by Underwriters' Laboratories Inc., they have sealed conduit boxes, elongated bearing sleeves, spark-proof aluminum fans and long bracket registers. U. S. Electrical Motors Inc., Box 2058, Terminal Annex, Los Angeles 54, Calif. Adams 3-3131

Specify POPE
HEAVY DUTY
WHEEL HEADS
"A"
Note the big precision bearings and the big shaft.
A pair of precision thrust bearings stabilize the shaft against any axial movement in either direction. (No end play)
The double row cylindrical roller bearings carry the radial loads with ease and at low temperature.
"B"
Power-Max 25 HP—available with standard No. 30, 40, 50 or 60 milling machine noses.
Taper mounting provides for precise individual preloading of the radial bearings.
Send us your specifications and ask for Catalog No. 59

POPE Heavy Duty Wheel-Head Spindles are designed for a wide variety of applications such as grinding, boring, milling, drilling and many other operations requiring PRECISION COMBINED WITH RUGGEDNESS in the spindles.

For continuous production and trouble-free operation THERE'S NOTHING LIKE A POPE SPINDLE WITH ROLLER BEARINGS.

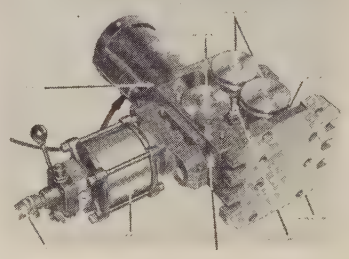
No. 94

Specify POPE® PRECISION SPINDLES
POPE MACHINERY CORPORATION
Established 1920
261 RIVER STREET · HAVERHILL, MASSACHUSETTS

Universal Centering Device

The St. Mary's Spin Roll is self-centering and self-adjusting to uniform diameters, lengths, speeds and feeds. Concentricity (up to 1.250-in. finished diameter) is achieved through a series of synchronized interlocking rollers, driven by a motor. The workpiece rotates on its own diameter between the rolls, while secondary diameters are generated. Every inside or outside diameter is concentric to all other diameters in the same plane.

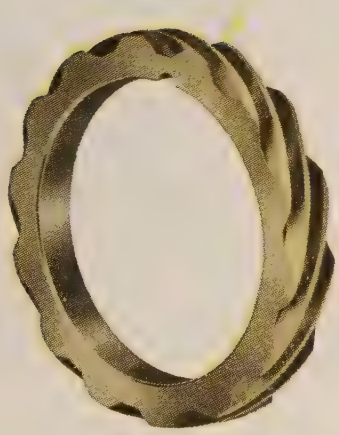
Used as a machine accessory or as a self-combined bench unit, the Spin Roll is adaptable for all rotary machining and grinding operations. It converts a surface grinder into a centerless external grinder which will accommodate centerless OD work and grind radii on pilots and locators. Adapted to an internal grinder, it will grind bushings, die buttons, etc. Used on lathes to turn, drill, bore or chamfer, the Spin Roll will give jig bore accuracy for concentric work. As a stationary chuck, it can be used on milling machines and drill presses and for chamfering and inspection and gage tests. Reamers or rotary files can be used in the unit as in a conventional chuck. Pivot Punch & Die Corp., 373 Old Niagara Falls Blvd., North Tonawanda, N. Y. Jackson 1200



How a shift in gears saved $256,000

Five million MUELLER BRASS CO. forged ring gears improve automatic transmission operation . . . at lower cost to the manufacturer.

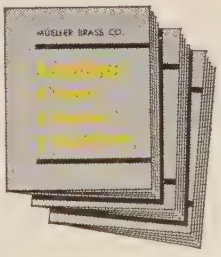
Ever since one of the leading manufacturers of automotive transmissions began using ring gears forged from Mueller Brass Co. bearing bronze, production costs have been cut nearly $256,000. That's because the rough forging weighs less and is closer to finished size than a sand cast ring gear formerly used. This shift in gears resulted in a savings in metal costs, greatly reduced machining time and increased tool life. In addition, the use of forged gears has cut scrap loss and eliminated costly inspection rejects.



The performance of these forged ring gears is also far superior to the sand cast gear, which had a tendency to flake away and crack around the teeth, causing failures. More than five million forged ring gears have now been used in these transmissions without a single failure. Being porous, the sand casting was difficult to balance, but the forging has a dense, homogeneous structure that helps keep it in perfect balance.

Strong, long-wearing non-ferrous metal parts, forged to your specifications by Mueller Brass Co., can help reduce your costs and improve the performance of your products just as they have done in this transmission application. For complete information, write us today.

Write today for your complete set of Mueller Brass Co. engineering manuals.



MUELLER BRASS CO. PORT HURON 19, MICHIGAN

154

YOU BUY ONE MACHINE . . .
GET THE PERFORMANCE OF TWO

BROWNHOIST *diesel-electric locomotive-cranes double as switch engines*

The exceptional performance of Industrial Brownhoist Diesel-Electric Locomotive-Cranes handling bulk materials with magnet, hook or bucket is well known to railroads, mines, steel mills and other large manufacturing plants. Not so well known, perhaps is the fact that these powerful, efficient machines perform equally well as switch engines. Employing electric powered locomotion with the same type of travel generator, motor and axle reduction unit as modern switching locomotives, Brownhoist Cranes provide rapid acceleration, high drawbar pull and speeds of twelve miles per hour for switching operations. They will haul up to 7 or 8 heavily loaded cars on straight, level track. During switching operations, the rotating superstructure that actuates the crane mechanism can be mechanically disengaged to eliminate wear on the shafts and other driven parts in the upperworks. Brownhoist Cranes are available in capacities from 25 to 90 tons and up for your switching and heavy duty materials handling operations — two dependable pieces of equipment in one husky unit for greater versatility and economical operation. For complete information, consult your nearest Brownhoist representative or write us today.

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN • **DISTRICT OFFICES:** New York, Philadelphia, Pittsburgh, Cleveland, Chicago, Denver, San Francisco, Montreal • **AGENCIES:** Detroit, Birmingham, Houston

BROWNHOIST MATERIAL HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

BROWNHOIST

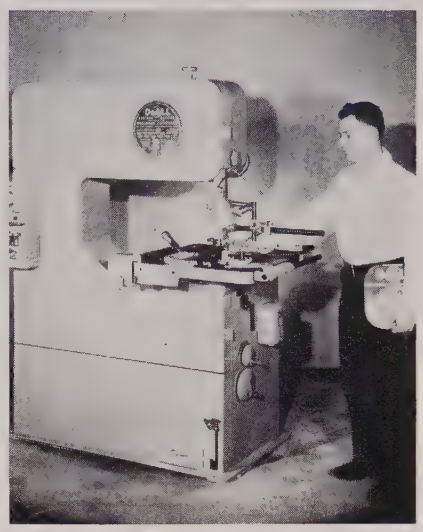
BUILDS BETTER HEAVY DUTY MATERIALS HANDLING EQUIPMENT

Versatile, Deep-Throat Contour Saw

This 30-in. contour saw is designed for job shops which need a low-cost, deep-throat machine. Engineered and powered for straight or curved metal sawing, it is easily adapted for band filing, metal polishing, finishing and slicing hundreds of materials. You merely add the proper accessory (20 are available). Carbide tools can be finish ground on these machines.

Frame construction is of heavy-gage steel and of welded, box-frame design. A heavy trunnion and cradle support the 24 x 24-in. work table. It tilts 45 degrees to the right, 10 degrees to the left. The saw-blade welder (also used for annealing) handles work up to ½-in. in width.

A variety of models is available. They have fixed or variable speed controls, with speed ranges between 50 and 5200 fpm. Variable-speed models have high or low-speed ranges for high-speed friction or conventional sawing. Fixed-speed machines include models with a single, fixed speed or several, stepped speeds. DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill. Vanderbilt 4-1122



Expanded Metal Truck Beds

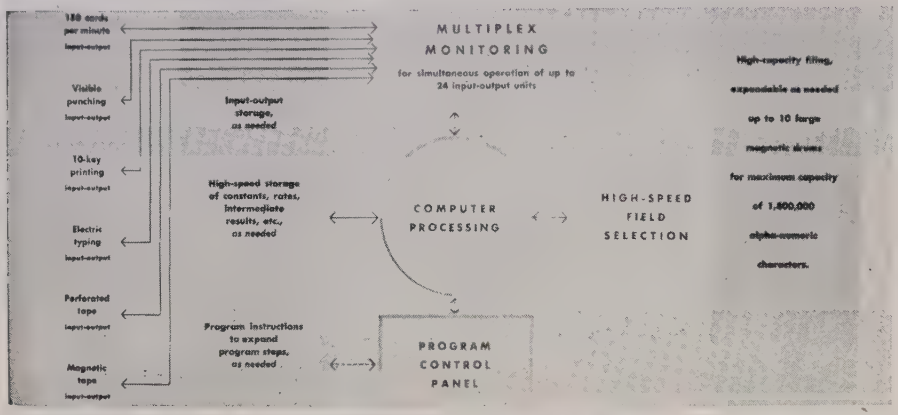
Diamond-shaped expanded metal in Morrison Steel Co.'s truck beds has reduced the over-all weight of the vehicle by as much as 2 tons, increasing cargo weight proportionately. They used 4 lb per sq ft grating on one 18-ft straight truck and one 32-ft trailer. The metal was welded to crossmembers and side railings. Drainage obstacles were overcome with the new beds.

Expanded metal is produced from solid sheet that is slit and stretched on precision machines to form a one-piece sheeting with uniform diamond-shaped openings. No metal is removed during expanding operations. Depending on the gage and opening, the sheeting may cover ten times the area of the solid sheet from which it is made. Finishes include plain, lacquered, galvanized, painted, etc. Wheeling Corrugating Co., Wheeling, W. Va. Wheeling 3900

Stradler Type JackStacker

Designed to ease loading and unloading of bar and tube stock into and out of pigeonhole racks, the JackStacker incorporates a 14-ft roller platform and a 19-ft 6-in. catwalk which raises and lowers the operator to load or unload the racks. Stock is raised to storage height. The straddle-type stacker is capable of handling 6000-lb bundles of steel up to 24 ft in length. It has a lift of 120 in.

For serving lower pigeonholes, the catwalk is detachable. It is built on four casters. The truck is equipped with dual controls, one set on the standard control handle for operation from the floor, the other set for operation from the catwalk. Rigid tubular guard rails with expanded metal foot guards assure operator safety. An interlock between the JackStacker and catwalk prevents operation from the catwalk unless it is properly engaged to the truck. Lewis-Shepard Products Inc., Watertown, Mass. Watertown 4-5400


MULTIPLEX MONITORING
for simultaneous operation of up to 24 input-output units
Input-output storage, as needed
High-speed storage of constants, rates, intermediate results, etc., as needed
COMPUTER PROCESSING
HIGH-SPEED FIELD SELECTION
High-capacity filing, expandable as needed up to 10 large magnetic drums for maximum capacity of 1,800,000 alpha-numeric characters.
Program instructions to expand program steps, as needed
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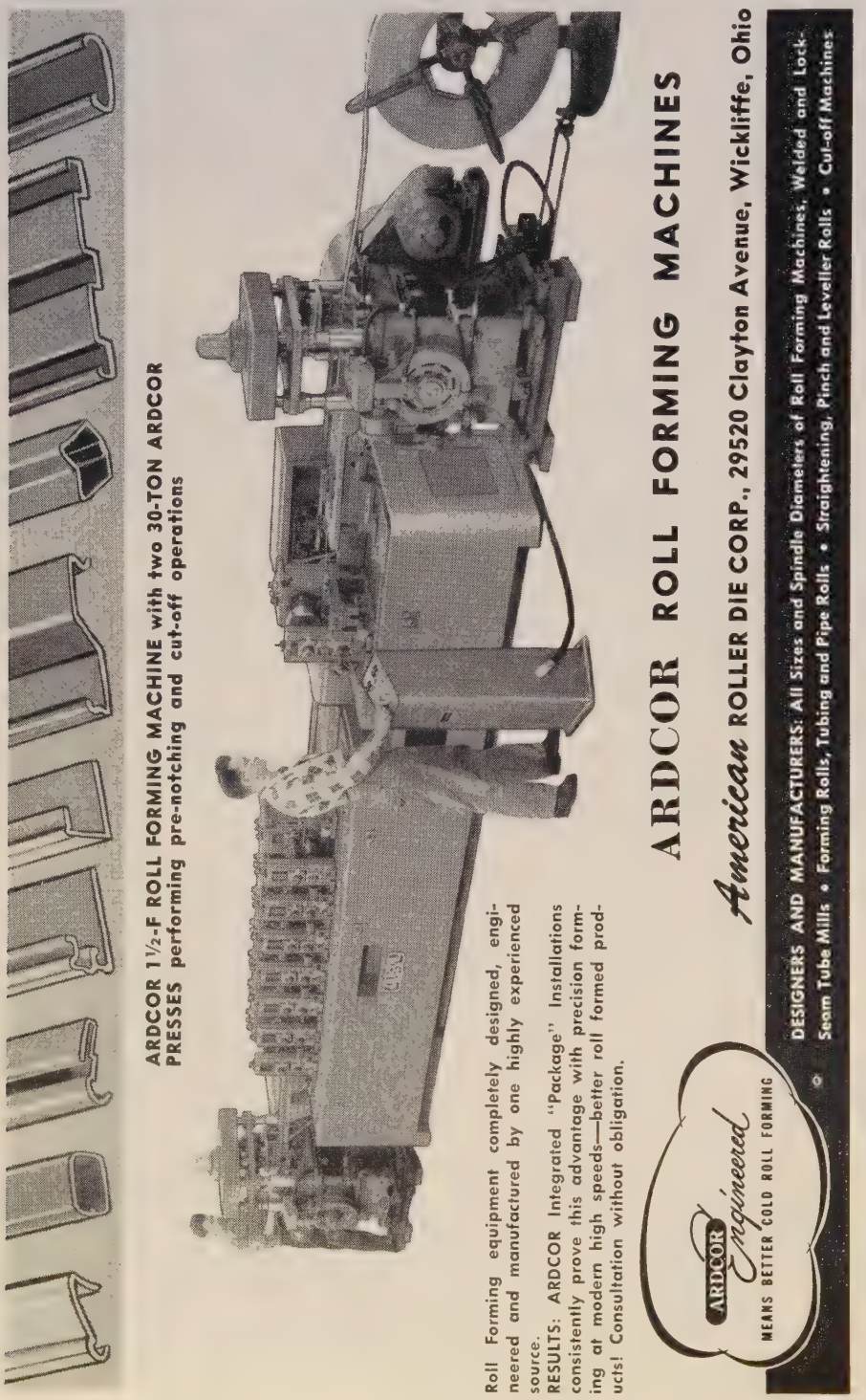

ARDCOR 1½-F ROLL FORMING MACHINE with two 30-TON ARDCOR PRESSES performing pre-notching and cut-off operations
ARDCOR ROLL FORMING MACHINES
American ROLLER DIE CORP., 29520 Clayton Avenue, Wickliffe, Ohio
DESIGNERS AND MANUFACTURERS: All Sizes and Spindle Diameters of Roll Forming Machines, Welded and Lock-Seam Tube Mills • Forming Rolls, Tubing and Pipe Rolls • Straightening, Pinch and Leveller Rolls • Cut-off Machines
ARDCOR Engineered MEANS BETTER COLD ROLL FORMING
Roll Forming equipment completely designed, engineered and manufactured by one highly experienced source.
RESULTS: ARDCOR Integrated "Package" Installations consistently prove this advantage with precision forming at modern high speeds—better roll formed products! Consultation without obligation.

Univac File-Computer

Combined billing, inventory control and sales analysis are done in a single, high-speed operation. A customer order can be processed immediately and completely. Up-to-the-minute figures on inventory and sales are available at the press of a key.

The Multiplexer unit in the system permits the simultaneous operation of up to 24 different input-output units. Up to 100,000 invoice line items or other input data may be processed in a 6-hour day, each according to its program instructions. Input-output units may be any combination of 80-or-90-column punched cards, paper or magnetic tape, typewriter or ten-key, tape-printing devices. A built-in, self-checking device monitors operations.

Because of the high-speed random access, no sorting, merging, collating, reproducing or pulling of cards from a tub file is required before processing.

Master and control data are filed on magnetic drums in unit record areas of a standard size, determined in planning the application. If the application requires 40 characters for each item, a single magnetic drum holds data for 4500 item records. Up to ten drums may be used, for a maximum of 45,000 item records of this size.

For billing application, the unit record area can be subdivided as needed for item number, item name, warehouse location, one or more unit prices, inventory balance, sales to date, sales by customer type, unit cost of sale, etc.

From these data, many computations can be made at millisecond speeds for each line item. The inventory balance can be checked to determine back orders. The price can be selected according to customer type. Extensions can be made for partial or complete shipment. The invoice total can be accumulated.

In the same operation, a new inventory balance and one or more new sales-to-date totals can be computed and re-filed on the magnetic drum. Remington Rand Inc., 315 Fourth Ave., New York 10, N. Y. Spring 7-8000

NEW literature

Write directly to the company for a copy

Stereo Microscopes

The value of wide-field, three-dimensional magnification in assembly and inspection is explained in detail. A ten-question, model-selector card aids in the selection of the right microscope for the job—catalog D-15, 38 pages. Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.

Rigidmils

"Sundstrand Rigidmils for Miscellaneous Die Block Milling" covers models 77 and 55. The sequence of operations is illustrated and briefly described—4 pages. Sundstrand Machine Tool Co., Rockford, Ill.

Compressors

Here is a bulletin on gas-engine-driven compressors in the 330 to 660-hp range. All features of the SVG, four-cycle type are detailed—form 3128-A, 44 pages. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Preplated Metals

Specifications, properties and typical uses for 14 finish-to-base metal combinations of preplated metals are correlated on a Sampler-Selector. The pocket-size slide chart tells at a glance: Base metal, plated surfaces, size of sheet, coiled strip, flat strip, gages, tempers, properties and typical uses—American Nickeloid Co., Peru, Ill.

Heat Exchanger Tubing

Two typical specifications, ASTM A-249 and A-269, are broken down to show how Electrunite stainless steel tubing is processed. Photographs show production operations necessary to meet specifications—HES-1. Republic Steel Corp., Steel and Tubes Div., 224 E. 131st St., Cleveland 8, O.

Carbide Tool Life

Would you like to increase carbide tool life and reduce tool costs? Here is information on new steel cutting grades CA-608 and CA-610, which are made by the Crystalloy process —Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

Patterned Metal

Cost and use advantages of Rigid-Tex, a patterned, design-strengthened metal, are given in the *Rigidized Digest* — 4 pages. Rigidized Metals Corp., 684 Ohio St., Buffalo 3, N. Y.

FILMS AVAILABLE

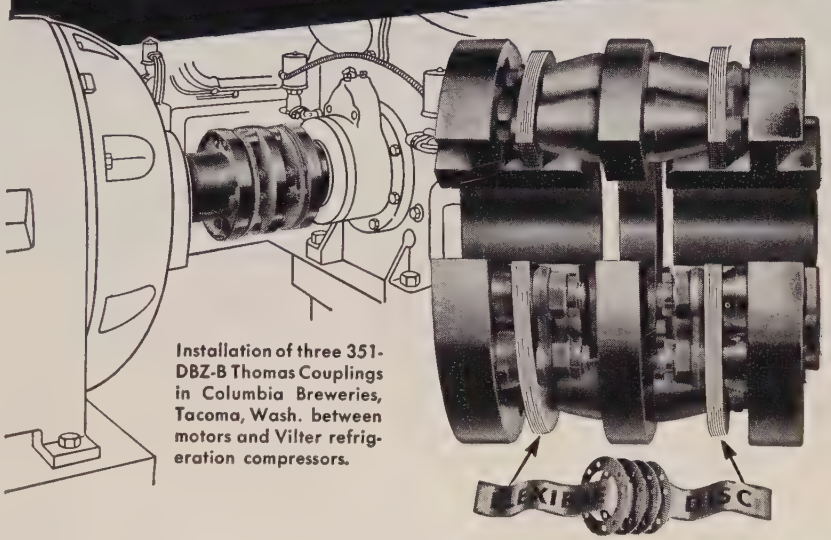
Hydraulic Fires

"Before Hydraulic Fires Start" features Pydraul, F-9, fire-resistant hydraulic fluid. A movie, it points out that fire-resistant fluids make possible the increased use of hydraulic power where the danger of fire exists—16 mm, 12 minutes. Monsanto Chemical Co., 1700 S. Second St., St. Louis 4, Mo.

Grinding

"Extending the Range of Modern Surface Grinding" examines new grinder features and attachments. They permit the application of the surface grinding to jobs other than flat grinding—16 mm. DoAll Co., Film Div., Des Plaines, Ill.

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

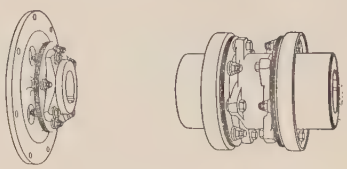


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

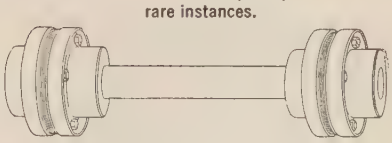
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



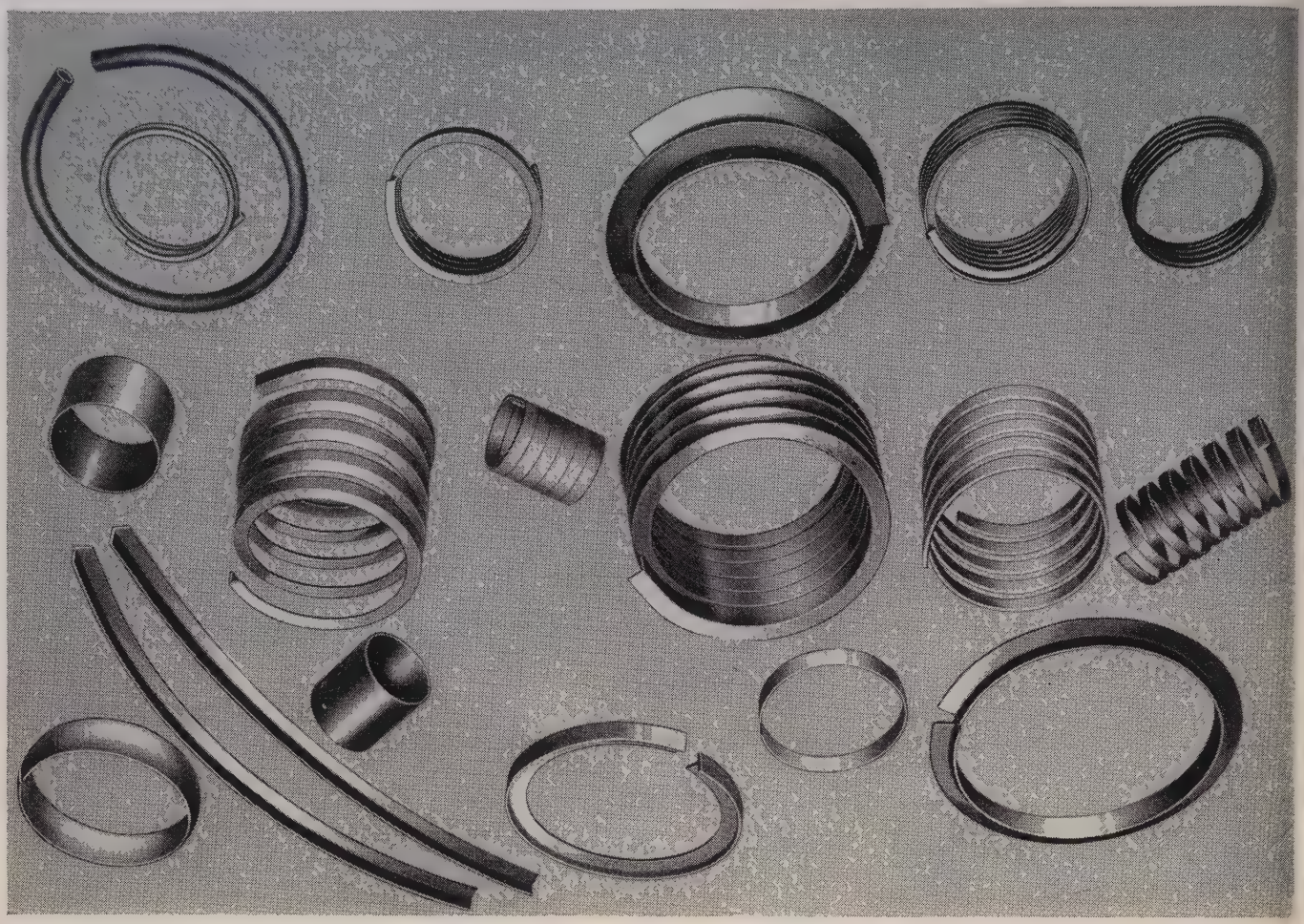
Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

Write for our new Engineering Catalog No. 51A

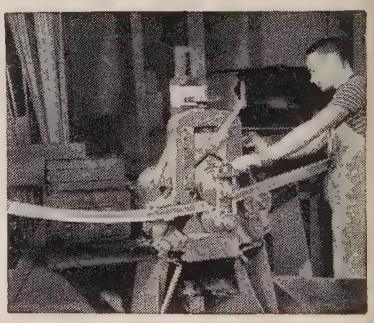
THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.



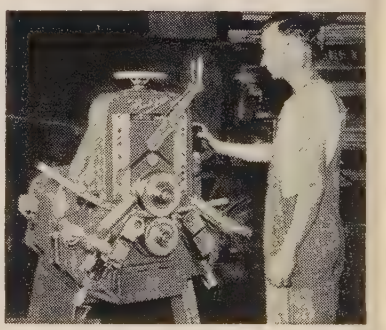
IF YOU DO JOBS LIKE THESE

"BUFFALO" OA BENDING ROLLS COULD BE SAVING YOU MONEY!

Yes, if your product includes coils, arcs, circles of light metal shapes—your fastest, most flexible method is with "Buffalo" OA Bending Rolls. Their hardened tool steel pinch-type rolls are changed in *minutes* to handle angles, flats, pipes, channels, tees, tubes, many special shapes—accurately "roll out the jobs" at speeds adjustable between 15 and 60 R.P.M. The range of products you can produce at these speeds is endless. "Buffalo" Q Factor* features include: (1) adjustable upper roll, (2) quick release and return of upper roll, (3) leg-in attachment and leg-out shoe, (4) all adjustable guides, (5) enclosed alemite lubrication, (6) fingertip forward, reverse and stop control, (7) direct reading scales for adjusting rolls quickly—many others, described in *Bulletin 3344-B.* WRITE FOR YOUR COPY TODAY. "Buffalo" also builds larger bending rolls for heavy structurals, as well as Wrapping Rolls for cylinders—Bulletins on request.



Bending wide channel section on vertical axis—high speed single-pass work.



Bending tee vertically, OA Bending Rolls also do the difficult leg-in angle bending.

*The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.

The Machine Tool Show—Chicago, Illinois
Sept. 6-17, 1955

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Market Outlook

SCUTTLEBUTT in the steel market is taking a turn toward the more optimistic side with respect to third quarter prospects. Up to now, it had been freely predicted that demand pressure would ease around midyear, especially should the auto industry be hit by a strike. Now, however, market observers appear less certain demand will slump to any great extent.

NOT FAZED—For one thing, the auto steel buyers don't seem to be fazed by the talk of a strike. They're ordering forward delivery tonnage (June and July especially) just as though nothing out of the ordinary were in the wind. Also, over-all demand on the steel mills is still rising. Volume is developing from construction and related lines of consumption at an encouraging rate. Consequently, support for high-level steel production (allowing for vacation interruptions) through the summer seems assured, even though auto business may be cut back.

HEAVY CARRYOVER—The mills are certain to enter the third quarter with heavier carryover tonnage than was the case at the end of the first three-month period. Some of the sheetmakers may find it necessary to blank out July production to care for the overflow from the second quarter, with shipments already running behind schedule. Also, vacation curtailments will cut steel production to some degree in the period. The net result: Tonnage available for new third-quarter orders will be significantly under that in the second quarter.

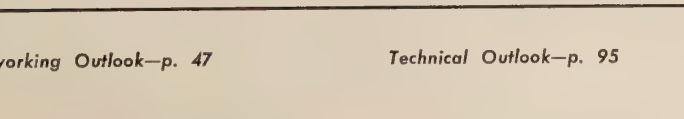
DELIVERIES EXTENDED—Sellers of hot-rolled and cold-rolled sheets, also galvanized, are sold up for the current quarter and have booked tonnage well into the third period. Some of them are accepting orders into September on a conservative basis. At the same time, most consumers are not overordering ahead, although some of them would place more tonnage with the mills if they could—acting on the theory they can cancel what they don't need in event supply conditions ease later.

PRODUCT MIX—Significantly, rising demand from consuming areas other than autos, the largest steel buyer, forecasts possible broadening of the product mix over coming months. Recent accelerated activity in the industry saw something like 40 per cent of steel production going into the light products, with the auto industry taking around 26 per cent of the total. Some of this light steel, though not much, has been going into inventories of consumers fearing shortages. A cutback in auto needs, consequently, could be followed by cutbacks in "scare" orders on mill books. In such event, the released semifinished tonnage could be diverted to production of the heavier products.

PRODUCTION—The steel mills maintained production last week at a level only slightly under the all-time high of 2,324,000 tons, established for the week ended Mar. 29, 1953. The estimated national rate for last week was 95.5 per cent of capacity, equal to 2,305,000 tons.

SCRAP EASES—Undertone of the scrap market was easier last week, especially in the Pittsburgh area. STEEL's composite on steelmaking scrap declined to $36.08 from $37.41. Other markets remained steady.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Apr. 24	Change	Same Week 1954	Same Week 1953
Pittsburgh	98.5	+ 0.5*	72	99.5
Chicago	99	+ 1*	79.5	105.5
Mid-Atlantic	96	+ 1	57	97.5
Youngstown	96	0	67	106
Wheeling	94	+ 2.5	84	99.5
Cleveland	97.5	— 1*	75	104
Buffalo	104.5	0	67.5	106.5
Birmingham	90	0	53.5	101
New England	84	+ 2	60	85
Cincinnati	91	+ 0.5	61.5	96
St. Louis	106	+ 16	55.5	86.5
Detroit	91	+ 3	60.5	107
Western	96	— 2	81	106
National Rate	95.5	0	69	99.5

INGOT PRODUCTION‡

	Week Ended Apr. 24	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	143.5†	142.2	140.8	101.8
NET TONS (In thousands)	2,305	2,284	2,262	1,636

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 47 Technical Outlook—p. 95

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 19 1955	Apr. 12 1955	Month Ago	Mar. Average
(1947-1949=100)	144.7	144.7	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Apr. 19

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525	Sheets, Electrical	$9.350
Rails, Light, 40 lb	5.917	Strip, C.R., Carbon	7.493
Tie Plates	5.275	Strip, C.R., Stainless, 430 (lb)	0.415
Axles, Railway	7.500	Strip, H.R., Carbon	5.113
Wheels, Freight Car, 33 in. (per wheel)	48.500	Pipe, Black, Buttweld (100 ft)	15.000
Plates, Carbon	4.675	Pipe, Galv., Buttweld (100 ft)	18.605
Structural Shapes	4.517	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	154.216
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	227,875
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, Boiler (100 ft)	‡
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Carbon	‡
Bars, H.R., Alloy	8.875	Tubing, Mechanical, Stainless, 304 (100 ft)	161.193
Bars, H.R., Stainless, 303 (lb)	0.423	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.000	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	4.963	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.160	Wire, Drawn, Carbon	7.938
Bars, C.F., Alloy	11.375	Wire, Drawn, Stainless, 430 (lb)	0.545
Bars, C.F., Stainless, 302 (lb)	0.438	Bale Ties (bundle)	5.860
Sheets, H.R., Carbon	4.870	Nails, Wire, 8d Common	7.815
Sheets, C.R., Carbon	5.864	Wire, Barbed (80-rod spool)	7.127
Sheets, Galvanized	7.220	Woven Wire Fence (20-rod roll)	16.925
Sheets, C.R., Stainless, 302 (lb)	0.553		

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 20 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.74	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.70	$93.18
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	36.08	37.41	37.75	26.00	29.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 20 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin Plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, 7/32-5/8" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne.	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$35.50	$38.50	$38.50	$26.50	$33.00
No. 1 Heavy Melt, E. Pa.	37.75	37.75	38.75	22.00	26.00
No. 1 Heavy Melt, Chicago	35.00	36.00	36.00	29.50	29.50
No. 1 Heavy Melt, Valley	35.50	37.50	37.50	27.50	33.75
No. 1 Heavy Melt, Cleve.	33.50	35.00	35.00	24.50	30.25
No. 1 Heavy Melt, Buffalo	32.50	32.50	32.50	23.50	29.75
Rails, Rerolling, Chicago	52.50	52.50	50.50	39.50	46.50
No. 1 Cast, Chicago	41.50	41.50	40.00	38.50	42.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	16.75	16.00
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price Apr. 20	Last Change	Previous Price	Mar. Avg.	Feb. Avg.	Apr. 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	33.222	33.000	29.955
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.710
Zinc	12.00	Apr. 6, 1955	11.50	11.500	11.500	10.250
Tin	92.00	Apr. 20, 1955	92.125	87.194	90.908	96.260
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	27.556	27.000	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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STEEL CORPORATION — *Pittsburgh*

Nonferrous Metals

Early indications are that British release of stockpile copper will not relieve shortage. After initial shock, London price bounced back. Metal was still hard to get

Nonferrous Metal Prices, Pages 132 & 133

TOO LITTLE, TOO LATE: That's the cry that went up when the British government let loose 45,000 tons of copper on an unsuspecting market. It may take the rest of the year to see how justified that cry was, but early reactions uphold it.

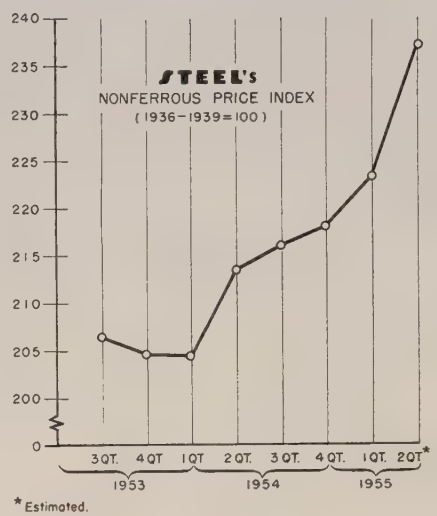
The initial psychological impact was tremendous, as indicated by the drastic slump in the London price of copper. For a brief period, it looked like 45,000 tons was the answer to the shortage. But even that amount, when spread over eight months, is just a dribble. As the shock wore off last week, the London Metal Exchange went into action, and the price rebounded.

Indirect Effects—The effects on the American market were two-fold: Upward pressure on producers' price was relieved, and scrap prices slipped. Some observers are wondering what will happen to the domestic price of 36 cents if the London price stays soft.

The cry of too late arose because British consumers were in need of the additional metal two or three months ago. It was this scrambling for available copper that pushed the price to record heights. But the British government, with its strong Labor party, was in an even more untenable position during the Rhodesian strike than our government was during the strikes last summer. To release government copper then probably would have had serious repercussions not only in Rhodesian labor negotiations but also in the government. Perhaps the reason for the delay lies in the fact that the full effects of interrupted production in Africa in February weren't scheduled to show up on the consumers' market until April and May.

Planting the Seed—While this was strictly a British action, it has been said that the seed was planted on this side of the ocean. Although a world shortage of copper had been building up since the third quarter last year, the acute situation beginning in January was triggered by the Rhodesian strike. Many Americans looked on it at first as a British problem, because Rhodesian mines supplied a large portion of Britain's and Europe's copper. But when the LME price began drawing off foreign metal from American markets, they changed their minds. They felt that if our government could take action to protect and help domestic consumers, the British government should release some of its stockpiled metal to help relieve the shortage. Also, American stockholders in the large Rhodesian mining companies may have had an influence.

Has It Reached the Peak?



*Estimated.
Based on Weighted Prices of Aluminum, Copper, Lead, Tin and Zinc.

Meanwhile, American consumers are looking to the day when supply starts to catch up with demand. Barring a strike in Chile—which was a strong possibility at presstime—that day could be around the corner, say the third quarter. Copper Institute statistics indicate producers are straining every reserve to up production. Primary output in the U. S. reached a new high in March, and both refined production and deliveries to fabricators were well above January and February levels. Both governmental and industrial sources indicate the deficit in demand will be considerably less in the second quarter than in the first.

Scrap Faces New Problem

Another important effect of the British action may be loosening of the scrap market. For some time, market observers have felt that considerable tonnage of high-priced scrap has been held off the market in the hope that licenses could be obtained for exporting the material to the higher-priced European markets. Many now feel that this market has been precluded. And it doesn't look as if the government is going to announce export policy for the third quarter for some time. So it's a guessing game, and the chances of taking a beating on this scrap are about 50-50. Rather than lose their shirts completely, some dealers may decide to get what they can and unload now.

Decision Due on Stockpiling

Another problem still facing the nonferrous world is lead and zinc stockpiling. On the heels of a statement by Otto Herres, chairman, National Lead & Zinc Co., that the government's stockpiling program is not solving the industry's production problems, Defense Mobilizer Arthur Flemming said that he would seek top-level advice on continuing the program. He will consult with Interior Secretary Douglas McKay, Commerce Secretary Sinclair Weeks and Secretary of State John Foster Dulles—they were in on the original stockpiling decision. Even if stockpiling should stop before the goal set by the President is reached, the goal would still be intact, and buying could continue whenever the government felt it necessary to uphold the price level. The combined price of lead and zinc is now 27 cents, 3 cents short of the level producers would like. Many industry men feel that regardless of what the government does about stockpiling, the main problems of overproduction and excessive imports will remain unsolved. Sentiment in favor of an effective tariff is growing.

Market Memos

- The effects of the government's release of 1.5 million lb of aluminum last month are just being felt. Letters of authorization did not reach the producers until well into April. By the middle of last week, at least one of the Big Three was accepting firm orders again.
- The special Senate committee studying the Texas tin smelter recommended continued operation of the plant through fiscal 1956. It asked the executive branch of the government to find a private enterprise to operate the plant thereafter.

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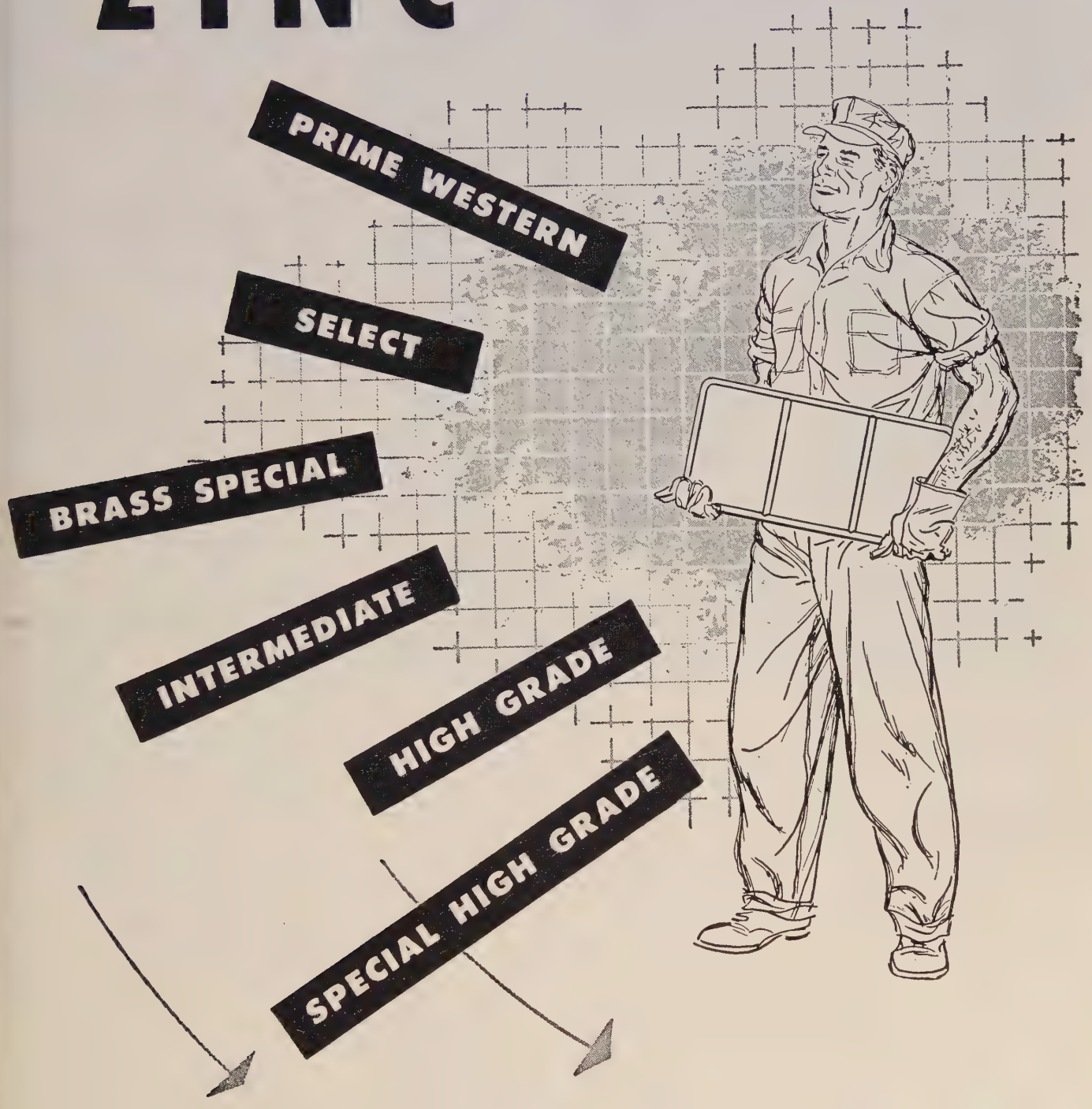


AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.20; No. 195, 4.5% Cu, 0.8% Si, 25.50; No. 214, 3.8% Mg, 26.20; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99 + %, $13-$18, f.o.b. Minneapolis, depending on quantity and form. For rod, add $2 a lb; for wire, add $3 a lb.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $317-$320 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $120-$130, nom., per troy oz.

Palladium: $17-$20 per troy oz.

Platinum: $76-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$56 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 87.00 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 92.00.

Titanium: Sponge, 99.3+ %, grade A-1 ductile (0.3% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.00; brass special, 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.35; special high grade, 13.50. Diecasting alloy ingot No. 3, 16.00; Nos. 2 and 5, 16.50.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy, 29.00-30.00; No. 12 foundry alloy (No. 2 grade), 28.50-29.50; 5% silicon alloy, 0.60 Cu max, 30.25-31.25; 13 alloy, 0.60 Cu max, 30.25-31.25; 195 alloy, 30.25-31.50; 108 alloy, 29.00-30.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 30.25-31.50; grade 2, 29.00-30.50; grade 3, 28.00-29.50; grade 4, 27.00-28.75.

Brass Ingot: Red brass No. 115, 37.00; tin bronze No. 225, 48.50; No. 245, 42.25; high-leaded tin bronze No. 305, 41.00; No. 1 yellow, No. 405, 32.25; manganese bronze No. 421, 34.75.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91B, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35-42.45; 30,000-lb lots, 41.48-42.58; l.c.l., 41.98-43.08. Weatherproof, 100,000 lb, 40.78-41.60; 30,000 lb, 41.03-41.85; l.c.l., 41.53-42.35. Magnet wire deld., 15,000 lb or more, 48.15-49.31; l.c.l., 48.90-50.06.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks	...	65	...

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam.(in.)or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.038	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ¼-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings 17.50-18.50; old sheet 14.00-16.00; borings and turnings 9.50-10.50; crankcases 14.00-16.00; industrial castings 14.00-16.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	26.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.05	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.86	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	58.24	....	22.125	21.875	21.375
Muntz Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 30.00-31.00; No. 2 copper, 28.50-29.50; light copper, 27.00-27.50; No. 1 composition red brass, 25.00-25.50; No. 1 composition turnings, 24.00-24.50; yellow brass turnings, 15.50-16.00; new brass clippings, 21.00-22.00; No. 1 brass rod turnings, 18.50-20.00; light brass, 16.00-16.50; heavy yellow brass, 17.50-18.00; new brass rod ends, 19.00-21.00; auto radiators, unsweated, 19.00-19.50; cocks and faucets, 19.50-21.50; brass pipe, 19.00-21.50.
Lead: Heavy 11.50-11.75; battery plate 6.00-6.75; linotype and stereotype 13.50-14.50; electrotype 12.00-12.50; mixed babbitt 12.00-14.00.
Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.
Monel: Clippings 28.00-34.00; old sheet 26.00-30.00; turnings 21.00; rods 28.00-34.00.
Nickel: Sheets and clips 57.00-70.00; rolled anodes 57.00-70.00; turnings 40.00-55.00; rod ends 57.00-70.00.
Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.75-5.50; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Aluminum: 1100 clippings, 19.50-21.50; 3003 clippings, 19.50-21.50; 6151 clippings, 19.50-21.50; 5052 clippings, 19.50-21.50; 2014 clippings, 18.50-20.50; 2017 clippings, 18.50-20.50; 2024 clippings, 18.50-20.50; mixed clippings, 18.00-20.50; old sheet, 17.50-19.00; old cast, 17.50-19.00; clean old cable (free of steel), 20.00-21.50; borings and turnings, 17.50-19.50.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.
Copper, Brass: No. 1 copper, 34.00; No. 2 copper, 32.50; light copper, 30.75; refinery brass (60% copper) per dry copper content, 30.00-30.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)
Copper, Brass: No. 1 copper, 33.00-33.50; No. 2 copper, 31.50-32.00; light copper, 29.25-29.75; No. 1 composition borings, 26.50-27.00; No. 1 composition solids, 27.00-27.50; heavy yellow brass solids, 20.50-21.00; yellow brass turnings, 20.00; radiators, 20.00-21.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb, $1.105; 200-499 lb, $1.09; 500-999 lb, $1.085; 1000 lb or more, $1.08.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

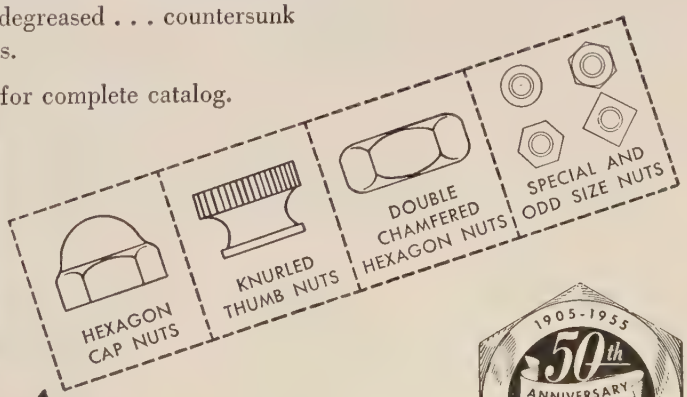
CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.
Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 70.60; 100-600 lb, 56.30; 700-1900 lb, 53.90; 2000-9900 lb, 52.10; 10,000 lb or more, 51.00.
Stannous Chloride (Anhydrous): Less than 50 lb, $1.564; 50 lb, $1.224; 100-300 lb, $1.074, 400-900 lb, $1.049; 1000-1900 lb, $1.025; 2000-4900 lb, 98.80; 5000-19,900 lb, 92.70; 20,000 lb or more, 86.60.
Stannous Sulphate: Less than 50 lb, $1.264; 50 lb, 96.40; 100-1900 lb, 94.40; 2000 lb or more, 92.40.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

Price, quality, delivery, technical assistance . . . any way you look at it . . . you can count on complete satisfaction if you specify "Fischer Turned" brass and aluminum nuts.

Standard or "specials", Fischer *turned* nuts cost no more than those produced by other, less accurate methods, yet each is burrless . . . tapped square with the face to Class 2 tolerances . . . cleaned and degreased . . . countersunk on both sides.

Write today for complete catalog.



Fischer SPECIAL MFG. CO.
476 Morgan St. • Cincinnati 6, Ohio

1905-1955 50th ANNIVERSARY FISCHER SPECIAL MFG CO CINCINNATI, OHIO

C-234-FS

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 135. Key to footnotes, page 137.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$65.00
Houston S5 .....70.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 .....64.00
Bridgeport,Conn. N19 ..69.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 ....64.00
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 ....64.00
Lackawanna,N.Y. B2..64.00
Munhall,Pa. U5 .....64.00
Pittsburgh J5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ..64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 .....78.00
Bridgeport,Conn. N19 ..83.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....83.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Midland,Pa. C18 ....78.00
Munhall,Pa. U5 .....78.00
Pittsburgh J5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14 .78.00
So.Duquesne,Pa. U5 ..78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 ....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 ....4.775
Munhall,Pa. U5 .....3.90
SparrowsPoint,Md. B2..3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.475
Houston S5 .....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 ....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S5 ....4.925
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ..4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 ....4.775
So.Chicago,Ill. R2 ....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ...4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
Torrance,Calif. C11 ....5.475
Worcester,Mass. A7 ..4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 ....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.30
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 .....5.00
Phoenixville,Pa. 4.20
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ...4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 ....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 ....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....4.30
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.25
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.45
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14.6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 ....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ...5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 ....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 ....4.225
Bridgeport,Conn. N19 ..4.475
Buffalo R2 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 ....4.225
Coatesville,Pa. L7 ....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.325
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah. C11 ....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....4.225
Houston S5 .....4.275
Ind.Harbor,Ind. I-2, Y1.4.225
Johnstown,Pa. B2 ....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ..5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago R2, U5, W14 4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ..4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 ....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 ....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 ....6.45
Coatesville,Pa. L7 ....6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif. (30) K1..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.50
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2..5.80
Youngstown Y1 .....5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 ....5.275
Ind.Harbor,Ind. I-2 ....5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 ....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 ....4.825

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta A11 .....4.50
Bessemer, Ala. T2 .....4.30
Birmingham C15 .....4.30
Bridgeport,Conn. N19 ...4.55
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Midland,Pa. C18 .....4.30
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11.....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23 ...5.05
So.Chicago, R2,U5,W14..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 .....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 .....5.075
Canton,O. R2, T7 .....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.175
Fontana,Calif. K1 ....6.125
FairlessHills,Pa. U5 ...5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1.5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2,U5,W14..5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS, H.R. Leaded Alloy

Warren,O. C17 .....5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.70
Ind.Harb.,Ind. I-2, Y1...6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....6.70
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.45
KansasCity,Mo. S5 .....5.45
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12, R2.5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ...5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 .....5.65
Putnam,Conn. W18 .....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2, M13.6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ...6.925
Massillon,O. R2, R8 ...6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ...6.925
Youngstown F3, Y1 ....6.625

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 .....7.70
Carnegie,Pa. C12 .....7.525
Chicago W18 .....7.525
Cleveland C20 .....7.525
Monaca,Pa. S17 .....7.525
Newark,N.J. W18 .....7.70
SpringCity,Pa. K3 .....7.70
Warren,O. C17 .....7.525

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.55

Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ...4.80
Seattle B3, N14, P23 ...5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2..5.70
KansasCity,Kans. S5 ...6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh J5, U8 .....5.72
Seattle B3, N14, P23 ...6.15
So.SanFrancisco B3 .....6.00
SparrowsPt. ¼-1" B2 ..5.70
Williamsport,Pa. S19 ...5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa.(3) F5 ....4.20
Franklin,Pa.(4) F5 .....4.30
Marion,O.(3) P11 .....4.20
Moline,Ill(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 .....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ....10.85
McK.Rks.(D.R.) L5 ...14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ....4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 .....4.15
Dravosburg,Pa. U5 ....4.05
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
FairlessHills,Pa. U5 ....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
Granite City,Ill. G4 ....4.25
Ind.Harbor,Ind. I-2, Y1.4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ...4.05
Mansfield,O. E6 (37) 4.05
Mansfield,O. E6 (38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 .....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....5.80
Youngstown Y1 .....5.80

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ...6.15
Dravosburg,Pa. U5 ....6.10
Ecorse,Mich. G5 .....6.20
Fairfield,Ala. T2 .....6.10
FairlessHills,Pa. U5 ....6.15
Fontana,Calif. K1 .....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ...5.00
Dravosburg,Pa. U5 ....4.95
Ecorse,Mich. G5 .....5.05
Fairfield,Ala. T2 .....4.95
FairlessHills,Pa. U5 ....5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 .....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Lackawanna,N.Y. B2 ...4.95
Middletown,O. A10 ....4.95
Newport,Ky. N9 .....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 ....4.95
SparrowsPoint,Md. B2..4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Dravosburg,Pa. U5 ....7.50
Ecorse,Mich. G5 .....7.60
FairlessHills,Pa. U5 ....7.55
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1 ..7.50
Lackawanna(37) B2 ....7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2.....5.55
Middletown,O. A10 ....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky.	A10.6.50	....
Canton,O.	R2 ...6.50	7.10
Dravosburg,Pa.	U5 5.70	....
Fairfield	T2 .....5.70	....
Gary,Ind.	U5 ....5.70	5.95
Ind.Harbor	I-2 ..5.70	5.95
Kokomo,Ind.	C16..5.80	....
MartinsFry.,O.	W10 5.70	....
Newport,Ky.	N9..5.70	5.95
Pitts.,Calif.	C11..6.45	....
SparrowsPt.	B2 ..5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ...5.95

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Delphos,O. N16 .....6.10‡
Dover,O. R1 .....5.45‡
Dravosburg,Pa. U5 ...5.45†
Fairfield,Ala. T2 .....5.45†
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Kokomo,Ind. C16 .....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45‡
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ..6.20*
SparrowsPt.,Md. B2 ...5.45‡
Warren,O. R2 .....5.45†
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....6.325

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.20
SparrowsPoint(30) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Dravosburg,Pa. U5 ....5.85
Kokomo,Ind. C16 .....6.20
Newport,Ky. N9 .....5.85
Niles,O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized
Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Dravosburg,Pa. U5 ..5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 .....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwest.Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons,John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West. Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...4.05
Allenport,Pa. P7 .....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.05
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.05
Birmingham C15 .....4.05
Bridgeport,Conn. N19 ..4.35
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Ind.Harbor,Ind. I-2, Y1.4.05
Johnstown,Pa.(25) B2 ..4.05
Lackaw'na,N.Y.(25) B2.4.05
LosAngeles(25) B3 ....4.80
Milton,Pa. M18 .....4.05
Minnequa,Colo. C10 .....5.15
N.Tonawanda,N.Y. B11..4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco S7 .....5.00
Seattle(25) B3, P23 ....5.05
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2 ..4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5 .....4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19 ...7.00
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....6.70
Ind.Harbor,Ind. Y1 ....6.70
LosAngeles B3 .....7.90
Newport,Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown U5, Y1 ....6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.15
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.15
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.15
Houston S5 .....6.40
Ind.Harbor,Ind. I-2, Y1.6.15
KansasCity,Mo. S5 ....6.40
Lackawanna,N.Y. B2 ..6.15
LosAngeles(25) B3 ....6.90
Seattle(25) B3, P23 ....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2 ..6.15
Warren,O. R2 .....6.15
Weirton,W.Va. W6 ....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....4.30
Warren,O. R2 .....4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Boston T6 .....6.30
Cleveland A7, J5 .....5.75
Conshohocken,Pa. A3 ..5.80
Dearborn,Mich. D3 ....5.85
Detroit D2, M1, P20 ....5.85
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.85
Follansbee,W.Va. F4 ..5.75
Fontana,Calif. K1 .....7.50
FranklinPark,Ill. T6 ....5.85
Ind.Harbor,Ind. I-2 ....5.85
Ind.Harbor,Ind. Y1 ....5.75
Indianapolis C8 .....5.90
LosAngeles C1 .....7.80
Middletown,O. A10 ....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5 ..5.75
NewHaven,Conn. A7 ....6.50
NewHaven,Conn. D2 ....6.20
NewKensington,Pa. A6..5.75
Pawtucket,R.I. R3 ....6.40
Pawtucket,R.I. N8 ....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 ....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R6 ....5.75
Sharon,Pa. S3 .....5.75
SparrowsPt.,Md. B2 ....5.75
Trenton,N.J.(31) R5 ..7.30
Wallingford,Conn. W2 ..6.20
Warren,O. B9, R2, T5..5.75
Weirton,W.Va. W6 ....5.75
Worcester,Mass. A7 ....6.60
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy

Boston T6 .....12.80
Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 ....14.55
FranklinPark,Ill. T6 ..12.45
Harrison,N.J. C18 ....12.45
Pawtucket,R.I. N8 ....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ....12.75
Youngstown C8 .....12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 .....8.60
Dearborn,Mich. D3 ....8.70
Dover,O. G6 .....8.60
Ecorse,Mich. G5 .....8.70
Ind.Harbor,Ind Y1 ....8.60
Lackawanna,N.Y. B2 ..8.425

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	..	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford, Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

STRIP, Electrogalvanized

Cleveland A7 .....5.75*
Dover,O. G6 .....5.75*
Riverdale,Ill. A1 .....5.85*
Youngstown C8 .....5.75*
Warren,O. B9, T5 ....5.75*
Weirton,W.Va. W6 ....5.75*
Worcester,Mass. A7 ....6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3 .....6.15
Warren,O. B9 .....6.15

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.775
Riverdale,Ill. A1 .....4.625
Sharon,Pa. S3 .....4.475
Youngstown U5 .....4.475

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Arma-ture	Electric	Motor	Dyna-mo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Electric	Motor	Dyna-mo
Brackenridge,Pa. A4	....	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95§	12.50§	13.00§	14.00§

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed. †Fully processed only. ‡Coils annealed; semiprocessed ½c lower. §Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE,American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$6.60
Dravosburg,Pa. U5 ....6.60
Fairfield,Ala. T2 .....6.70
FairlessHills,Pa. U5 ....6.70
Gary,Ind. U5 .....6.60
GraniteCity,Ill. G4 ....6.70
Ind.Harbor,Ind. I-2, Y1.6.60
Niles,O. R2 .....6.60
Pittsburg,Calif. C11 ....7.35
SparrowsPoint,Md. B2...6.70
Warren,O. R2 .....6.60
Weirton,W.Va. W6 .....6.60
Yorkville,O. W10 .....6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5 ....6.20
Follansbee,W.Va. F4 ...6.20
Gary,Ind. U5 .....6.20
GraniteCity,Ill. G4 .....6.30
Ind.Harbor,Ind. Y1 ....6.20
Yorkville,O. W10 .....6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5 ....$7.85
Gary,Ind. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10 .....$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 .....9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ...5.75
Aliquippa,Pa. J5 .....5.75
Alton,Ill. L1 .....5.925
Atlanta A11 .....5.95
Bartonville,Ill. K4 .....5.85
Buffalo W12 .....5.75
Chicago W13 .....5.75
Cleveland A7, C20 .....5.75
Crawfordsville,Ind. M8..5.85
Donora,Pa. A7 .....5.75
Duluth,Minn. A7 .....5.75
Fairfield,Ala. T2 .....5.75
Fostoria,O.(24) S1 .....5.95
Houston S5 .....6.00
Jacksonville,Fla. M8 ....6.27
Johnstown,Pa. B2 .....5.75
Joliet,Ill. A7 .....5.75
KansasCity,Mo. S5 .....6.00
Kokomo,Ind. C16 .....5.85
LosAngeles B3 .....6.70
Minnequa,Colo. C10 ....6.00
Monessen,Pa. P7 .....5.75
Newark 6-8 ga. I-1 .....6.40
No.Tonawanda B11 .....5.75
Palmer,Mass. W12 .....6.05
Pittsburg,Calif. C11 ....6.70
Portsmouth,O. P12 .....5.75
Rankin,Pa. A7 .....5.75
So.Chicago,Ill. R2 .....5.75
So.SanFrancisco C10 ...6.70
SparrowsPoint,Md. B2 ..5.85
Sterling,Ill.(1) N15 ....5.75
Sterling,Ill. N15 .....5.85
Struthers,O. Y1 .....5.75
Waukegan,Ill. A7 .....5.75
Worcester,Mass. A7 ....6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.375
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Cleveland A7 .....7.20
Donora,Pa. A7 .....7.20
Duluth,Minn. A7 .....7.20
Fostoria,O. S1 .....7.20
Johnstown,Pa. B2 .....7.20
LosAngeles B3 .....8.15
Milbury,Mass.(12) N6 ..7.50
Minnequa,Colo. C10 ....7.45
Monessen,Pa. P7, P16..7.20
Muncie,Ind. I-7 .....7.40
Palmer,Mass. W12 .....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 .....7.20
Roebling,N.J. R5 .....7.50
So.Chicago,Ill. R2 .....7.20
So.SanFrancisco C10 ...8.15
SparrowsPt.,Md. B2 ....7.30
Struthers,O. Y1 .....7.20
Trenton,N.J. A7 .....7.50
Waukegan,Ill. A7 .....7.20
Worcester A7,J4,T6,W12.7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....6.90
Alton,Ill. L1 .....7.075
Buffalo W12 .....6.90
Cleveland A7 .....6.90
Donora,Pa. A7 .....6.90
Duluth,Minn. A7 .....6.90
Johnstown,Pa. B2 .....6.90
KansasCity,Mo. S5 .....7.50
LosAngeles B3 .....7.85
Minnequa,Colo. C10 ....7.075
Monessen,Pa. P7, P16..6.90
NewHaven,Conn. A7 ....7.20
Palmer,Mass. W12 .....7.20
Pittsburg,Calif. C11 ....7.85
Portsmouth,O. P12 .....6.90
Roebling,N.J. R5 .....7.20
So.Chicago,Ill. R2 .....6.90
So.SanFrancisco C10 ...7.85
SparrowsPoint,Md. B2 ..7.00
Struthers,O. Y1 .....6.90
Trenton,N.J. A7 .....7.20
Waukegan,Ill. A7 .....6.90
Worcester,Mass. A7 ....7.20

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....11.375
Bartonville,Ill. K4 .....11.30
Buffalo W12 .....11.20
Chicago W13 .....11.20
Cleveland A7 .....11.20
Crawfordsville,Ind. M8.11.30
Fostoria,O. S1 .....11.20
Jacksonville,Fla. M8 ...11.73
Johnstown,Pa. B2 .....11.20
Kokomo,Ind. C16 .....11.20
Minnequa,Colo. C10 ...10.95
Monessen,Pa. P16 .....11.20
Muncie,Ind. I-7 .....11.40
Palmer,Mass. W12 ....11.50
Roebling,N.J. R5 .....11.50
So.SanFrancisco C10 ..11.55
Waukegan,Ill. A7 .....11.20
Worcester,Mass. A7, T6.11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....9.90
Buffalo W12 .....9.90
Johnstown,Pa. B2 .....9.90
Minnequa,Colo. C10 ...10.025
Monessen,Pa. P16 .....9.90
Muncie,Ind. I-7 .....10.10
Portsmouth,O. P12 .....9.90
Roebling,N.J. R5 .....10.20
SparrowsPt.,Md. B2 ...10.00

ROPE WIRE (A)

Alton,Ill. L1 .....9.75
Bartonville,Ill. K4 .....9.75
Buffalo W12 .....9.75
Fostoria,O. S1 .....9.75
Johnstown,Pa. B2 .....9.75
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
SparrowsPt. B2 .....9.85
Struthers,O. Y1 .....9.75
Worcester,Mass. T6 ....9.65
Worcester,Mass. J4 ....10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425§
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.575
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.15 7.55†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48).	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer,Mass. W12	7.20 7.60†
Pitts.,Calif. C11	7.85-8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
So.S.Fran. C10	7.85 8.25**
SparwsPt.B2(48).	7.00 7.55*
Sterling(1)(48)	N15 6.90 7.475
Struthers,O.(48)	Y1 6.90 7.40†
Worcester,Mass.	A7 7.20 ....

*Based on 11c zinc; †5c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN Fence, 9-15½ Ga. Col.

Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	151†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	151**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	150

†Based on 5c zinc; *11c zinc; §10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed Col.

AlabamaCity,Ala. R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	165
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	164**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
So.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	163

†Based on 5c zinc; *11c zinc; §10c zinc; **Subject to zinc equalization extras.

WIRE (16 Gage)	An'ld Stone	Galv. Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.10
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawfrdsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.15	....

*Based on 11c zinc; †5c zinc; §10c zinc; **Subject to zinc equalization extras.

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	145
Houston,Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
Sparrows Pt.,Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

TIE WIRE, Automatic Baler (14½ Ga.) Per 97 lb Net Box)

Coil No. 3150	
Donora,Pa. A7	$8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77
Coil No. 6500 Stand.	
Donora,Pa. A7	$9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05
Coil No. 6500 Interim	
Donora,Pa. A7	$9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage.	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
¾" and smaller	55
⅞" to 1⅛", inclusive.	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive.	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
7/16-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	23.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S10	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed.	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns.	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed:	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	31.25-39.75†
Bronze, 5000-lb lots	51.50-54.75†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	97.00
Nickel-Silver, 5000-lb lots	47.50-51.00
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten Melting grade, 99% 60 to 200 mesh:	Dollars
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.78c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c. H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv.*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+ 8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+ 8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold-Rolled, 10%	Strip, Carbon Base, Cold-Rolled, Both Sides
*Copper**	*26.60*	*33.00*

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa.-B10	58.00	58.50	....	....
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homstead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	85.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.02[6]	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[2]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	45.28[9]	7.47	...	7.20	8.60	12.30	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.40	12.00	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	11.75	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.00	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	11.81	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	11.95	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.15	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	11.84	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73[6]	12.13	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[9]	6.96	8.80	6.74	7.86[8]	11.96	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	11.75	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	8.90	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64[8]	12.04	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30
San Francisco	7.55	8.95	9.40	51.65	7.80	...	7.35	10.05	13.05	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.50	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	7.80	...	7.80	10.85§§	14.25	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Buffalo and Spokane (11-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **⅛-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [2]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

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Rail Buying Is Sidetracked

SLOW BUSINESS isn't discouraging producers of railroad rails from making plant improvements.

U. S. Steel Corp. has completed the first phase of its rail mill improvement program. Included are three, new, end-hardening installations for rails at the corporation's Edgar Thomson Works, Braddock, Pa. Two units were installed in 1954, the third this year.

How It's Done—End hardening requires heat treating. Each hardening unit treats both ends of 18 rails at one time. Every 90 seconds a hardened rail is passed from one of the machines to inspection tables.

The newest end-hardening installation has four preheat burners that use natural gas; one superheat burner; a forced-air quench, which cools the hardened ends before transfer to inspection tables; and auxiliary equipment.

Why It's Done—Need for end-hardened rails developed with the use of heavier and faster rolling stock. Rails had a habit of wearing down at the ends. End-hardened rails last longer, provide a smoother ride for passengers and cause less wear and tear on rolling stock.

Railroads have set their brakes on rail buying this year. Last year's business was hardly an inspiration for order placing: Freight car loadings dropped 11.6 per cent below those of 1953. Competition from other forms of transportation also has reduced the need for rails. In 1953, an estimated 394,000 miles of track was in operation. At the high point—1930—operated trackage totaled 429,883 miles. The decline started the following year.

Signal Result—Reduced business is not the only reason for the decline in trackage. New signaling devices make for more efficient track usage. Some railroads can do as much with two tracks as they used to do with four. Unneeded tracks are being dismantled.

Railroads make up their rail orders once a year—in September. Present buying is based on plans made last September, when business was slow. If present improved business conditions prevail next September, carriers are apt to be more purchase minded than they were last September. Freight-car loadings this year are 5 per cent above those of the corresponding period of last year.

Die Is Cast — Even if railroads wanted to revise their rail buying upward now, they would meet difficulty. Steel producers are booked heavily with orders for products other than rails. To fill them, the steel industry is producing ingots at about 95 per cent of capacity, leaving little room to give more steel for rails.

Shortage of rail orders held production of standard rails (weighing over 60 lb a yard) to 56 per cent of capacity in January and February.

Comparisons—In those first two months of this year, 189,339 net tons of standard rails were shipped by mills, compared with 339,787 tons in the corresponding period of 1954. January and February were the leaders in 1954. As that year unfolded, rail production dropped sharply. Total output of standard rails in 1954 was 1,113,366 net tons—55 per cent of capacity.

Outlook for shipments of standard rails this year is at the 1954 level or slightly lower. That would mean an annual production rate of around 55 per cent of capacity. The two months for which figures are available were at that pace.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 134

A miscellaneous sprinkling of small and medium-sized jobs is keeping demand for reinforcing bars at a high level. Mills in most districts are taxed to the utmost in accommodating regular customers.

Strong demand for all steel products prevents producers from allocating more ingots to reinforcing bar mills, most of which are sold through June.

Indications are that many contractors would pay premiums to get additional tonnages. In the Boston area, however, efforts by one or two distributors to stiffen prices met with slight success. Most distributors have built up substantial backlogs. Pressure on prices centers mainly in bridge tonnage, which is heavy. Building requirements are mounting, and quotations for this type work generally are firmer, with delivery becoming an increasingly strong factor.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 135 & 136

Pressure on the sheet mills continues unabated. Consumers are taking all the tonnage available and are placing orders that run as far ahead as September. The latter delivery position, however, is exceptional, with both consumers and producers inclined to follow a conservative course in ordering ahead. Automotive demand holds the key to the future. Supply availability in the third quarter hinges on whether there will be auto production cutbacks in the period—either because of labor trouble or slackening in car buying.

Sellers of hot and cold-rolled and galvanized sheets are sold up for the current quarter in the East. They are accepting tonnage into September, but on a conservative basis. Most consumers are moving cautiously, but some would place much more tonnage with their suppliers than is now possible, perhaps on the theory that they could cancel later should a pronounced easing in supply develop. It is this type of business mills are trying to avoid.

Chicago district sheetmakers no longer are sure demand for sheets will drop off in the third quarter. The automotive industry is seeking all the tonnage of cold-rolled it can get in June and July. Moreover, motorcar builders are complaining that the mills are falling behind in current shipments. Mill carryover tonnage from second to third quarter will be substantial, so that new tonnage open for the latter period will be significantly under that available in the second quarter.

Most New England sheet users are covered well into the third quarter. New bookings, as a result, are falling off, with shipments in excess of current buying, including auto tonnage. Until cutbacks come against auto volume, producers can hardly hope to improve their deliveries, now three to four weeks delinquent in an increasing number of cases. The backlog of cold-rolled orders is sufficient to keep the mills under pressure through the third quarter. Carryover tonnage will necessitate the blanking out of one month's production in the third quarter. Vacation interruptions will serve to hamper production to some extent.

In the Pittsburgh district, mills are booking orders for the third quarter in most cases. Producers discount the possibility of a sharp reduction in requirements during the current period. Incoming orders are certain to decline from present levels, in the opinion of sellers, but, barring a strike, third quarter demand will remain fairly good. Some mills already are firmly booked for July and August.

Wire . . .

Wire Prices, Pages 136 & 137

Springmakers are supplying close to 600 springs per automobile. They are booked through June and are under heavy pressure for deliveries —wire mills, producing a wide range of grades, are, too.

Cutbacks are not expected before June. Orders are in for July, and when automotive cutbacks do come, the slack may be taken up somewhat by substantial demand for springs from other consumers.

Wire orders generally are heavier, notably for manufacturers wire and high carbon specialties. Based on projected estimates, May schedules are filled, while close to 60 per cent of June tonnage is committed. Welded mesh capacity is taken up into the fourth quarter. Among the hundreds of wire mill products, there are some on which shipment is not so far extended, but the average is

Steel Ingot Production Statistics—January, 1954, Through March, 1955

Period	OPEN HEARTH Net tons	OPEN HEARTH Per cent of capacity	OPEN HEARTH ‡Index	BESSEMER Net tons	BESSEMER Per cent of capacity	BESSEMER ‡Index	ELECTRIC Net tons	ELECTRIC Per cent of capacity	ELECTRIC ‡Index	TOTAL Net tons	TOTAL Per cent of capacity	TOTAL ‡Index	Calculated weekly production (Net tons)	Number of weeks in month
1955														
January	8,054,345	86.0	125.7	199,229	49.0	56.7	584,162	63.6	163.6	8,837,736	82.7	124.2	1,994,974	4.43
*February	7,734,884	91.5	133.7	197,091	53.7	62.1	564,959	68.1	175.1	8,496,934	88.0	132.3	2,124,233	4.00
†March	9,058,000	96.7	141.4	255,000	62.7	72.6	666,000	72.5	186.5	9,979,000	93.3	140.3	2,253,000	4.43
†1st Quarter	24,847,229	91.4	133.6	651,320	55.2	63.8	1,815,121	68.1	175.0	27,313,670	88.0	132.2	2,123,925	12.86
1954														
January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	48.7	121.0	7,289,600	69.0	102.5	1,645,508	4.43
1st Quarter	20,429,406	75.9	109.9	642,432	54.4	63.0	1,252,485	48.6	120.8	22,324,323	72.8	108.1	1,735,950	12.86
April	6,365,326	70.9	102.7	162,657	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.29
May	6,817,951	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,738	70.7	105.0	1,686,848	4.43
June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,465	4.29
2nd Quarter	19,885,283	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
1st Half	40,314,689	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,705,900	25.87
July	6,040,120	65.3	94.3	205,313	50.6	58.4	382,164	43.1	107.0	6,627,597	62.9	93.2	1,499,456	4.42
August	6,021,496	65.0	94.0	217,837	53.6	62.0	427,574	48.2	119.7	6,666,907	63.1	93.7	1,504,945	4.43
September	6,140,266	68.6	99.1	214,065	54.5	63.0	453,152	52.8	131.1	6,807,483	66.7	98.9	1,590,533	4.28
3rd Quarter	18,201,882	66.3	95.8	637,215	52.9	61.1	1,262,890	48.0	119.1	20,101,987	64.2	95.2	1,530,997	13.13
9th Month	58,516,571	71.7	103.7	1,848,033	51.6	59.7	3,869,015	49.5	123.0	64,233,619	69.1	102.5	1,647,016	39.00
October	6,973,568	75.2	108.9	237,754	58.5	67.7	490,211	55.2	137.3	7,701,533	72.9	108.3	1,738,495	4.43
November	7,307,151	81.4	117.9	231,191	58.7	68.0	551,085	64.1	159.4	8,089,427	79.1	117.5	1,885,647	4.29
December	7,530,204	81.4	117.6	231,126	57.0	65.8	525,743	59.4	147.2	8,287,073	78.6	116.5	1,874,903	4.42
4th Quarter	21,810,923	79.3	114.7	700,071	58.0	67.1	1,567,039	59.5	147.8	24,078,033	76.8	114.0	1,832,423	13.14
2nd Half	40,012,805	72.8	105.2	1,337,286	55.4	64.1	2,829,929	53.8	133.5	44,180,020	70.5	104.6	1,681,767	26.27
Total	80,327,494	73.6	106.5	2,548,104	53.2	61.6	5,436,054	52.0	129.3	88,311,652	71.0	105.4	1,693,741	52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1955 of 2,114,196 net tons hearth, 91,810 net tons bessemer and 207,272 net tons electric ingots and steel for castings, total 2,413,278 net tons; based on annual capacities as of Jan. 1, 1955, as follows: Open hearth 110,234,160 net tons, bessemer 4,787,000 net tons, electric 10,807,150 net tons, total 125,828,310 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954, as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.

out three to four weeks, compared with early last quarter.

Wire rods are in outstanding demand in the East. One producer is booking more tonnage than at any time in two years. Broadly, manufacturers wire is moving relatively better than merchant items, although along the Atlantic seaboard there is improved demand for domestic nails and barbed wire as prices advance and deliveries become more extended on foreign products.

Plates . . .

Plate Prices, Page 134

Plate deliveries continue to tighten, with mills sold out for the current quarter on sheared plate and confronted with increasing demand for the third quarter.

Eastern producers report tankwork is brisk, especially for field oil storage. Jobbers are specifying actively, and increasing volume is moving to structural fabricators. Business with boiler shops, shipyards and railroad car builders leaves much to be desired, but there is some improvement in those areas of consumption. A recent ship contract involves the placing of a 32,000-ton tanker for Cities Service with the Bethlehem yard at Sparrows Point.

Line pipe inquiry is limited in the East, but the indirect effect of heavy commitments in other parts of the country is being felt by mills in the area.

At Pittsburgh, plate supply is reported almost as tight as that for sheet. Producers are rapidly filling order books for this quarter. Some customers, such as the railroads, are caught with short inventories and are unable to secure delivery on the short lead time prevalent since January. Deliveries can't be handled quickly owing to pressure from boilermakers, line pipe fabricators, construction and miscellaneous consuming lines. Railroad requirements are reported slightly better.

Heavier demand for carbon plates in New England is bolstered by railroad car tonnage for the Readville shops of the New Haven Railroad. Two-hundred newly designed piggyback carriers will take additional volume. While most plate fabricating shops in the area have enough steel for nearby needs, more concern is registered as to extended deliveries, now running into mid-third quarter on sheared plate. There are some openings in June schedules on universal plates.

Consumers likely to be pinched for supplies are those booking new fabricated work on which steel shipment in three to four weeks is wanted. They turn to the warehouses to help them over stringent supply periods. Not much help can be expected from the sheet-strip mills in relieving the plate pinch. However, some consumers are buying 0.1799 heavy-gage, hot-rolled sheets instead of 3/16-in. plates. Delivery is slightly better and cost lower for limited applications.

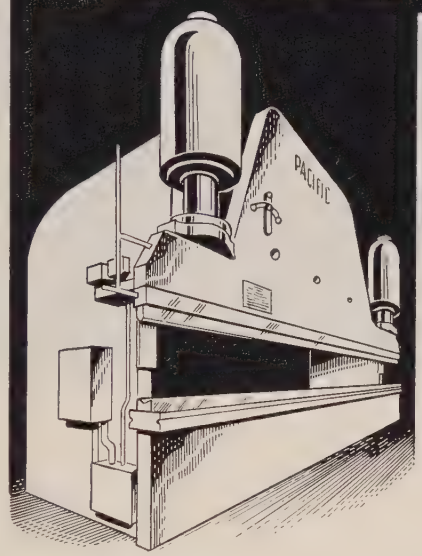
Contracts for two additional destroyers to be built at the Bethlehem-Quincy, Mass., yard (cost: $32.5 million) brings the number of destroyers under construction or contract at New England yards to 11. Plate requirements for these ships will be heavier in the second half of the year—both at Quincy and Bath, Me. yards.

Tin Plate . . .

Tin Plate Prices, Page 136

Shipments are gaining steadily, reflecting seasonal demands from canmakers. Production has been high, and the outlook is for a strong second quarter. Canmakers have held large inventories, but with their production rising, they require more tin plate. Other users are finding it necessary to replenish stocks.

Versatility



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Tubular Goods . . .

Tubular Goods Prices, Page 138

Merchant steel pipe orders are reported at a peak for the year. April volume was above that for March, reflecting seasonal improvement in building and construction generally.

Consumers still are pressing for quick deliveries. Producers, however, are having trouble giving prompt shipments in all instances. Order backlogs are relatively heavy, with promised deliveries ranging from about two weeks for buttweld tubes to two months for some oil country goods. Deliveries of all tube products are gradually lengthening, despite producers' efforts to speed shipments.

Tubemakers say there is some inventory-building by consumers fearing supply difficulties in the months ahead. This is minor, however. Oil country tube demand is growing, especially for alloy tubes for heavy-duty applications.

Construction also requires increasing tonnage. Standard pipe and conduit is in brisk demand, and the outlook for buying by the construction and petroleum industries is favorable through the summer.

Kaiser Steel Corp. has booked orders for 52,000 tons of pipe from Southern Pacific Co. for its 850-mile pipeline between Texas and California. Kaiser will supply 45,000 tons of 8⅝ and 12¾-in. welded pipe from its electricweld mill at Fontana, Calif., and 7000 tons of 16-in. pipe—to be fabricated from Kaiser steel by the Basalt Rock Co., Napa, Calif. Deliveries begin in May.

Warehouse . . .

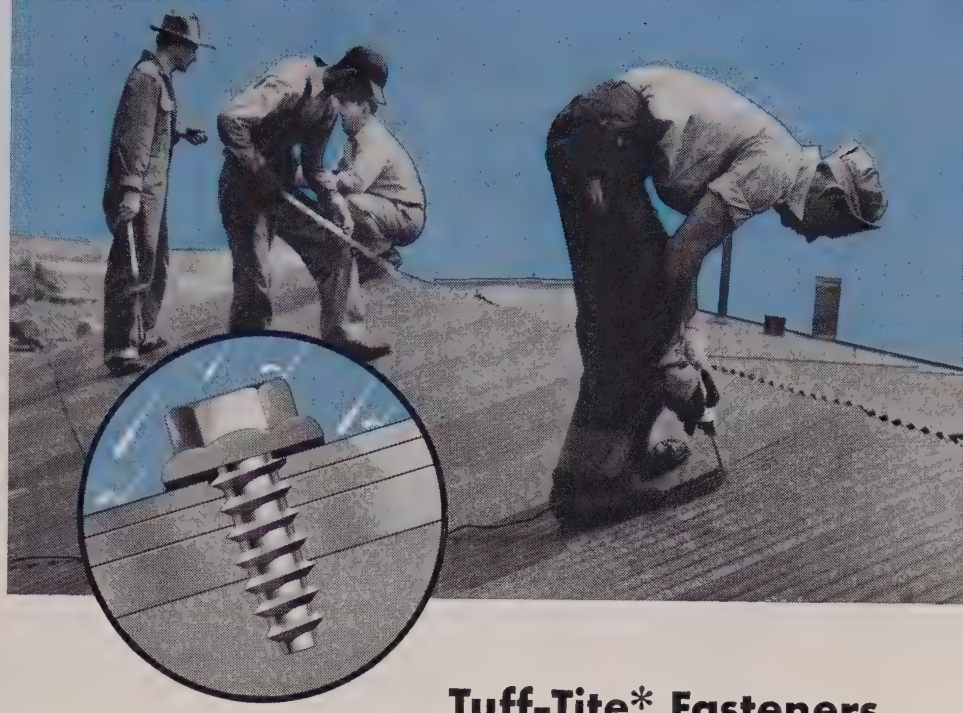
Warehouse Prices, Page 139

Warehouse business is increasing and is more diversified, with sheets and plates the most active. Distributors forecast that present volume will be maintained into the third quarter. Any deviation downward now seems more likely to come from plants closing for vacations rather than any significant weakening in industrial activity.

While the average size of orders is small, more substantial tonnages are being booked. This is due partly to the more extended deliveries promised by mills, especially on structurals, plates and sheets. More orders for construction steel and highway accessory items are going to warehouses. Shops with slitting equipment have stepped up operations.

With competition from the mills

(*Please turn to page* 148)



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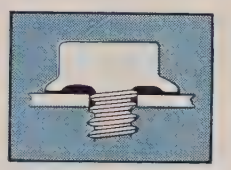

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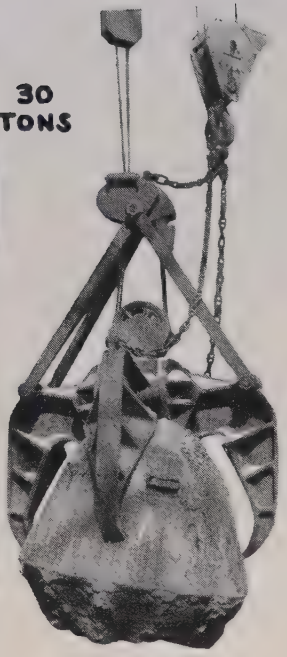

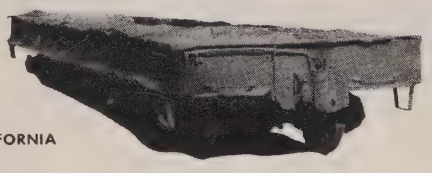

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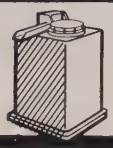

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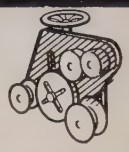

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Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

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Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: .Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l, 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%. Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered, Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer. (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching, Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta., deld.; less ton lots $6.30.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c pel lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c. f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington Pa., $1.24.

(*Concluded from page* 145)

dropping off, west coast distributors say current prospects are the brightest of the year. Inquiries for a wide range of products are up 10 per cent. No product is in short supply.

Steel Bars . . .

Bar Prices, Page 134

Trading in steel bars is changing from good to brisk. Deliveries are tightening around late June on hot-rolled bars in the East. Some mills are out of the market entirely for the second quarter on large rounds. Cold-finished carbon bar deliveries extend as much as three months in some instances. Alloy bars, however, are not in too active demand. Leaded carbon bars, because of their easy machining qualities, are moving at a good pace. One midwestern producer is quoting August delivery, having filled July capacity.

Sales to automakers and suppliers of parts have reached an apparent peak at Pittsburgh. Demand should remain strong for this quarter. Overall demand is at about the March level, which was relatively high but some producers estimate as much as 10 per cent of shipments are going into inventories. Consumer stocks, however, should be higher to handle a heavier amount of business than had been anticipated earlier this year. Bar mill backlogs extend about two months, and orders are not expected to decline until third quarter.

There is some hedge buying of both hot-rolled and cold-finished bars in New England, notably hot-rolled by converters. However, openings for the second quarter are narrowing. Consumers look for higher prices after midyear. The guess is prices will go up $3 to $4 per ton on carbon and alloy grades.

While miscellaneous industrial buying is up some, the bulge in demand largely comes from forge shops supplying automotive parts. Automobile production cutbacks, should they come because of a strike, or a slump in production in third quarter, would ease the bar market outlook considerably.

Iron Ore . . .

Iron Ore Prices, Page 149

Shipments of iron ore to lower lake ports this season are getting off to a fast start, reports the Lake Superior Iron Ore Association. Shipments to Apr. 18 totaled 595,215 gross tons. On that date a year ago no ore had been delivered to lower lake ports.

Ore consumption in March totaled 7,510,075 tons, compared with 5,931,800 in March a year ago. Stocks on hand Apr. 1 were 23,710,818 tons, against a stockpile of 30,587,462 a year ago. There are 182 blast furnaces operating, compared with 140 at this time last year. There are only 23 blast furnaces idle compared with 64 at this time a year ago.

Pittsburgh Steamship Division, U. S. Steel Corp., has all its 59 lake ore carriers in commission for the 1955 shipping season. Up to Apr. 18, the Pittsburgh fleet had carried 737,300 tons of ore, limestone and coal in the new season, compared with 95,441 tons in the same period last year.

Two of the Ford Motor Co.'s lake ore carrying vessels left the Rouge plant Apr. 16 on their first trip of the 1955 navigation season, getting cargoes at Escanaba, Mich., and Duluth. A third Ford vessel has been in service since Apr. 1, taking on a limestone cargo at Rogers City, Mich.

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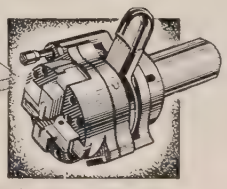

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Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Messabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$25.00-$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

58-60%	$3.25-$3.80
65%	4.15-4.25

Vanadium Ore

Cents per lb, V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

Inches Diam	Length	Per 100 lb
GRAPHITE		
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5⅛	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25
CARBON		
8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

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Scrap . . .

Scrap Prices, Page 152

Chicago—A slightly weaker tone has developed in the scrap market, with No. 1 and No. 2 heavy melting steel and turnings selling off $1 a ton. No. 2 dealers bundles are down $2. Buying continues light.

Futures trading in No. 1 heavy melting on the Chicago Mercantile Exchange resumed Apr. 18 after a lapse of more than a month. Opening sale for October delivery was $40 a gross ton. Five contracts were sold in that day's trading. Two went at $40, two at $39.50 and the final sale was at $39.75.

Pittsburgh — A substantial purchase by a leading steel producer established a new price for open-hearth scrap last week. Another mill paid an identical price later. Quotations for No. 1 heavy melting dropped $3 to a $35-$36 range. No. 2 heavy melting scrap was bought at $32-$33. No. 1 bundles and No. 1 busheling, as well as No. 2 bundles, dropped correspondingly.

Cleveland—Prices here on steelmaking grades of scrap are off about $2 per ton in sympathy with sharp reductions in nearby areas on substantial mill sales. New mill buying is extremely limited. Prospects are not considered promising for any substantial pickup in volume ordering in the immediate future.

A task force of the Institute of Scrap Iron & Steel Inc. meets in Cleveland May 11 to consider methods to improve the quality of No. 2 bundles and enforce higher standards. The Brokers Committee and the chairmen and vice chairmen of the Balers and Fair Trade Practices committees will participate. Later, the latter two committees will be tied into the project.

Boston—Steel scrap buying prices are supported by exports. Two vessels loaded nearly 10,000 tons of heavy melting grades at prices $2 to $4 a ton above those on tonnage for eastern Pennsylvania. The central Massachusetts consumer is paying brokers up to $30-$31 for top-grade, No. 1 heavy melting. For No. 2, the spread is $4 per ton, dock, over the domestic price.

New York—Brokers' buying prices are unchanged. Demand from domestic and foreign consumers continues strong, but supplies are sufficient to impart a note of general instability in the market.

Buffalo — Although scrap dealers report the market here is a shade easier, prices generally are holding, pending the placing of new orders. Mills hold large reserve stocks. One is holding up scrap shipments. A heavy flow of material by way of the lakes is expected to counter the high steel ingot operating rate.

Philadelphia—Scrap prices are unchanged, except for a reduction of $2 a ton in No. 2 bundles to $28, delivered, and a drop in No. 1 cupola cast to $37-$38. Prime grades of steel scrap are moving well, although for some reason, No. 2 heavy melting steel is not in so good supply as No. 1 heavy melting. Movement of scrap from this port to foreign destinations is being limited by the shortage of cargo space.

Cincinnati—The weakness noted elsewhere in the scrap market is unconfirmed here. No new orders have been placed, so the market here is largely nominal.

Detroit—The tone of the market generally is a little softer, although cast iron grades appear strong.

St. Louis—Large mill consumers have started buying scrap heavily at prices generally up $1 to $2 at shipping point. The rush is prompted by higher steel production. Mill stockpiles are expected to rise substantially as result of current purchases.

Los Angeles—Demand for steelmaking scrap is stronger. Dealers report April sales volume will exceed that of March by 5 to 10 per cent. Second quarter sales will be about equal to those in the like period a year ago.

San Francisco—Seasonal buying is exerting an upward influence on No. 1 cupola cast. Bids have been lifted to $43 a ton, compared with a top price of $40 a week ago. Steel grades are going into export.

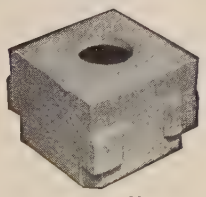
Seattle—The scrap market is firm and active. Higher steel mill operations, particularly at Bethlehem's Seattle plant, account for heavier consumption. Supplies are well balanced with consumption, giving sup-

(*Please turn to page* 154)

EUREKA FIRE BRICK WORKS

Works: Mt. Braddock, Fayette Co., Pa.
Dunbar, Pa. 4213

COVERED HOT TOP BRICK INGOT MOLD PLUGS



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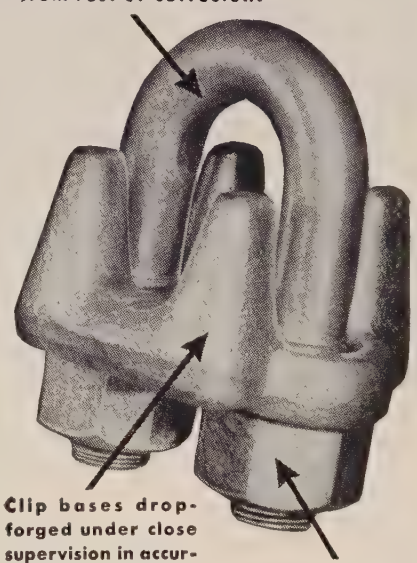
Heavy, steel U-bolt; hot galvanized after threading to prevent weakening from rust or corrosion.



Clip bases drop-forged under close supervision in accurately made dies. Bases made of high grade forging steel and hot galvanized.

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Upson-Walton drop-forged steel clips are made to the highest standards of quality for tough, heavy-duty service. *See your distributor* for quick and efficient service from stock. Write for free catalog on wire rope fittings

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YOU CAN DEPEND ON UPSON-WALTON'S 81 YEARS OF EXPERIENCE

Manufacturers of ALL THREE
WIRE ROPE • ROPE FITTINGS • TACKLE BLOCKS

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Apr. 20	$36.08
Apr. 13	37.41
Mar. Avg.	37.50
Apr. 1954	25.67
Apr. 1950	29.40

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	*27.00-28.00*
No. 1 busheling	*35.00-36.00*
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals, 5 ft lengths	41.00-42.00
Heavy turnings	35.00-36.00
Punchings & plate scrap	41.00-42.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Unstripped motor blocks	22.00-23.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*
Rails, 2 ft and under	*50.00-51.00*
Rails, 18 in. and under	*51.00-52.00*
Rails, random lengths	*46.00-47.00*
Railroad specialties	44.50-45.50

Stainless Steel Scrap

18-8 bundles & solids	210.00-220.00
18-8 turnings	105.00-110.00
430 bundles & solids	95.00-100.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Low phos.	*33.00-34.00*
Cut structural plate 2 ft and under	*39.50-40.50*
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	*33.00-34.00*

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Stove plate	40.00-42.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	29.00-30.00
Brake shoes	32.00-33.00
Clean auto cast	46.00-47.00
No. 1 wheels	43.00-44.00
Burnt cast	33.00-34.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*
R.R. malleable	45.00-46.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Rails, random lengths	45.00-46.00
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	41.00-42.00
Angles, splice bars	46.00-47.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	190.00-200.00
18-8 turnings	80.00-90.00
430 clips, bundles, solids	80.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	*25.50-26.50*
No. 1 busheling	37.00-38.00
Machine shop turnings	18.00-19.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Low phos.	*35.00-36.00*
Electric furnace bundles	*35.00-36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*

CHICAGO

No. 1 heavy melting	*34.00-36.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 factory bundles	37.00-38.00
No. 1 dealer bundles	*34.00-35.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	35.00-37.00
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*19.00-20.00*
Cut structurals, 3 ft	37.00-38.00
Punchings & plate scrap	38.00-39.00
Electric furnace bundles	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	*35.00-36.00*
Unstripped motor blocks	*29.00-30.00*
Clean auto cast	46.00-47.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
R.R. malleable	*46.00-47.00*
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	44.00-45.00
Rails, rerolling	52.00-53.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	95.00-100.00
430 bundles & solids	105.00-110.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange

(Week ended Apr. 20)
No. 1 Heavy Melting

	High	Low	Close
Oct.	40.00	38.50	38.50
Jan.	....	....	....

Sales (160-ton units): 8 October.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	29.50
No. 2 heavy melting	23.00
No. 1 bundles	29.50
No. 2 bundles	*20.00*
No. 1 busheling	29.00
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	17.50
Punchings & plate scrap	34.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	17.00-18.00
Short shovel turnings	25.00-26.00
Machine shop turnings	18.00-19.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	43.50-44.50
Rails, rerolling	43.00-44.00
Rails, random lengths	39.00-40.00
Angles, splice bars	40.00-41.00
Stand. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumers' plant)

No. 1 heavy melting	37.50-38.00
No. 2 heavy melting	34.00
No. 1 bundles	37.50-38.00
No. 2 bundles	*28.00*
No. 1 busheling	37.50-38.00
Electric furnace bundles	40.00
Machine shop turnings	22.50
Mixed borings, turnings	22.00
Short shovel turnings	25.00
Structurals & plate	41.00-42.00
Heavy turnings	34.00-35.00
Couplers, springs, wheels	42.50
Rail crops, 2 ft & under	52.00-53.00

Cast Iron Grades

No. 1 cupola	*37.00-38.00*
Malleable	44.00
Heavy breakable cast	41.00
Drop broken machinery	44.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	32.00-32.50
No. 2 heavy melting	28.00-28.50
No. 1 bundles	32.00-32.50
No. 2 bundles	24.00-25.00
Machine shop turnings	12.00-13.00
Mixed borings, short turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Low phos. (structural & plate)	34.00-35.00

Cast Iron Grades

No. 1 cupola	32.00-33.00
Unstripped motor blocks	22.00-23.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips solids	200.00-210.00
18-8 borings, turnings	95.00-100.00
430 sheets, clips, solids	75.00-80.00
410 sheets, clips, solids	65.00-75.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*22.00-23.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	17.50-18.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	15.00-16.00
Short shovel turnings	*16.00-16.50*
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	33.00-34.00

BUFFALO

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	27.50-28.50
No. 1 bundles	32.00-33.00
No. 2 bundles	25.50-26.50
No. 1 busheling	32.00-33.00
Mixed borings, turnings	20.50-21.50
Machine shop turnings	19.00-20.00
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	36.00-37.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	37.00-38.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	29.50-30.50
No. 1 bundles	33.00-34.00
No. 2 bundles	24.00-25.00
No. 1 busheling	33.00-34.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.50
Short shovel turnings	22.00-23.00
Cast Iron borings	20.00-21.00
Low phos. 18-in.	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast	35.00
Charging box cast	36.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 18-in. and under	48.00-49.00
Rails, random lengths	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	31.00
No. 2 heavy melting	29.00
No. 1 bundles	31.00
No. 2 bundles	24.50
Machine shop turnings	15.00
Short shovel turnings	17.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	*33.00*
Heavy breakable cast	*33.00*
Unstripped motor blocks	*33.00*
Brake shoes	32.00
Clean auto cast	42.00
Stove plate	36.50

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00*
Rails, 18-in. and under	46.00
Rails, random lengths	40.00-41.00
Rails, rerolling	*50.00*
Angles, splice bars	41.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00
Machine shop turnings	12.00-14.00
Mixed borings, turnings	12.00-14.00
Short shovel turnings	12.00-14.00
Electric furnace, No. 1	*35.00-37.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*36.00-40.00*
Heavy breakable cast	28.00
Unstripped motor blocks	*30.00-32.00*
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	27.00
No. 2 heavy melting	25.00
No. 1 bundles	26.00
No. 2 bundles	22.00
No. 1 busheling	27.00
Machine shop turnings	8.00
Mixed borings, turnings	8.00
Short shovel turnings	10.00
Cast iron borings	10.00
Cut structurals	27.00
Heavy turnings	9.00
Punchings & plate scrap	27.00

Cast Iron Grades

No. 1 cupola	*40.00-43.00*
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop Broken machinery	48.00

HAMILTON, ONT.

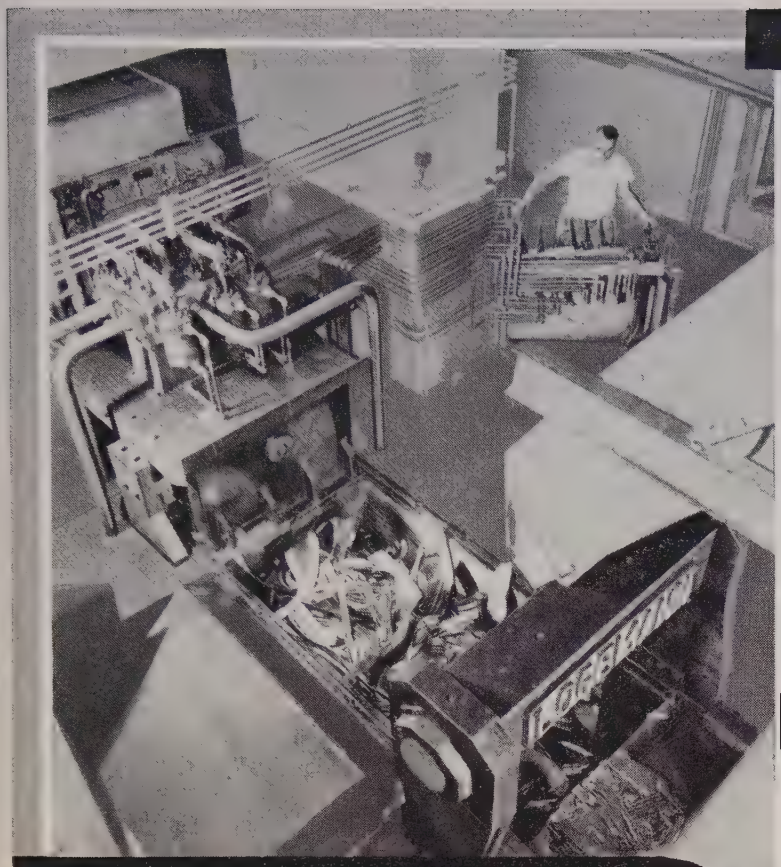
(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



LOGEMANN Metal Balers

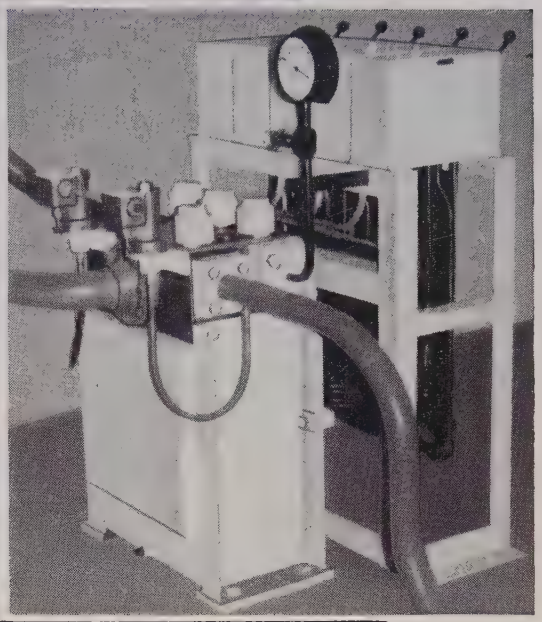
. . . powerful . . . compact . . . capable of high tonnage output!

In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

Hundreds of installations have established new records for tonnage, minimum maintenance, reliability, over extended periods of uninterrupted operation at high-speed.

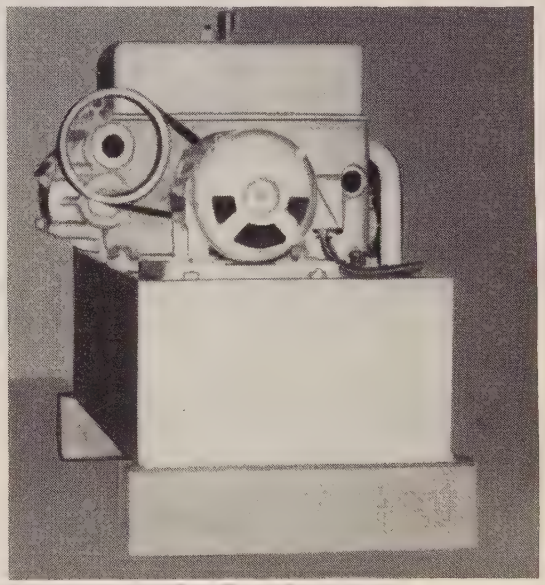
LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.

LOGEMANN



HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

LOGEMANN BROTHERS CO.

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The Air Gage That's Not Just Better – but Much Better!

Test the Dimensionair by the most rigid methods and you will *see* beyond all doubt that it has unparalleled accuracy and that it has many advantages beyond your expectations. Just setting it ready to gage is strikingly simple and fast—less than ten seconds—absolutely no fiddling around balancing air pressures.

It is the only dimensional air gage made to a definite predetermined accuracy. All critical dimensions are made precisely to specified tolerances to assure that accuracy. Every gage repeats the same measurements. It is the only air gage accurate enough to have a calibrated scale when set to one master. Its calibration is not left to the operator's adjustments but is built into the gage.

If you use old style air gages and are unfamiliar with the Dimensionair, you'll really appreciate its accuracy and ease of handling. Its eleven advantages positively justify the time you take to find out that these claims are not exaggerated. In quick, simple set up, speed of setting, gaging accuracy, stability and simple maintenance, the Dimensionair more than justifies its place in your production.

Don't take our word for it — or anybody's — take your own. Try it, buy it and use it. You'll insist that the next gage will be a Dimensionair, too. Just ask us for a chance to operate one.

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FOR ANYTHING IN MODERN GAGES...

Dial Indicating, Air, Electric, or electronic — for inspecting, measuring, sorting, or automatically controlling dimensions on machines.

(*Concluded from page* 151)

port to the $2 increase ($33 and $29, respectively) on No. 1 and No. 2 heavy melting steel. Export influences are adding strength. Larger shipments are coming from interior points.

Scrap Futures Again Traded

Trading in scrap futures was resumed on the Chicago Mercantile Exchange Apr. 18. Delivery months for the new contracts are October, 1955, and January, 1956.

Several trading specifications are changed. The contract has been raised from 40 to 160 gross tons. Delivery is to be in four gondolas. Each car will contain the same grade of scrap, though the total contract need not be composed of four cars of the same grade. Cars must originate at the same shipping point unless industrial bundles are involved.

No. 1 heavy melting steel, on which the contract is based, now is defined to permit inclusion of industrial bundles, provided they come direct from approved industrial sources. A car containing not more than 1000 lb of No. 2 scrap also is deliverable at par. Originally, No. 2 was authorized as a substitute at a discount of $5 per ton. This has been reduced to $3.

Permitted variation in quantity, over or under exact tonnage, now is 5 per cent, compared with 10 per cent formerly. Minimum price fluctuations are now 5 cents per ton, or $8 per contract, against 12.5 cents per ton previously. Hereafter, cars will be inspected on loading rather than unloading.

Commissions are unchanged at $18 per contract for nonmembers of the exchange, with a special rate of $65 for trading as many as five contracts on any one day.

Pig Iron . . .

Pig Iron Prices, Page 139

Activity in the pig iron market is leveling off at a high point. Consumption is expected to hold in May at the rate established in April, then dip the following month because of reduced need for automotive castings.

Shipments in June and July are expected to decline because foundries will close for their usual two or three-week vacations.

In the St. Louis area, blast furnaces have unusually large stockpiles of iron. Buying performance of steel castings firms serving the railroads has been especially disappointing.

Colorado Fuel & Iron Corp. plans

to place its Birdsboro, Pa., stack in operation later this spring, possibly by June 1. It has been down for many months.

No. 7 blast furnace of Tennessee Coal & Iron Division, U. S. Steel Corp., at Fairfield, Ala., is back in operation after a complete relining job.

Canada . . .

Prices on three important steel products were reduced last week by the Steel Co. of Canada, Hamilton, Ont. Two of the items — cold-rolled and galvanized sheets—were each cut $5 per ton. Hot-rolled sheets were reduced $3. H. G. Hilton, president, explained the company is passing on to its customers savings resulting from the reduction in the corporation tax announced by the Canadian government.

Rails, Cars . . .

Track Material Prices, Page 137

Domestic freight car orders in March comprised 2156 units, reports the American Railway Car Institute and the Association of American Railroads. Deliveries rose for the second consecutive month, involving 2833 cars, compared with 2422 in February and 4823 in March, 1954. Backlogs as of Apr. 1 amounted to 17,974 cars, against 18,663 on Mar. 1.

Structural Shapes . . .

Structural Shape Prices, Page 134

Seasonal rise in construction and building is being reflected in steadily lengthening deliveries of structural steel. Indications are demand will hold strong through the third quarter. Meanwhile, wide-flange beams are in especially tight supply. Practically no additional tonnage is available for shipment this quarter.

Barring Pennsylvania state bridgework, structural demand in the East is following much the same pattern of the past seven or eight months. School, commercial and industrial construction are in about the same relation to one another, but on a somewhat larger scale.

Widespread distribution of contracts for heavy fabricated structural steel in New England, with bridgework taking more than 30,000 tons, marks sharp competition with shop prices under pressure. Frequently, contractors soften original estimates by shopping for steel.

For the Massachusetts turnpike, over 12,250 tons have been booked by shops normally doing little bridgework. Eight companies have contracts, but the two largest integrated shops, usually doing a large share of bridge building in the area, are booking a minimum of the tonnage placed. One leading fabricator has taken none of the tonnage, the prices obviously being unattractive.

With several large bridges planned for construction this summer, and turnpike work in eastern Pennsylvania and Ohio, Pittsburgh mills report structural shapes in strong demand.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

550 tons, Reading railroad bridge over Schuylkill river, to Phoenix Bridge Co., Phoenixville, Pa.

530 tons, two multipurpose hangars, Otis Air Field Base, Falmouth, Mass., to Glazer Steel Corp., Knoxville, Tenn.; Blount Bros. Construction Co., Montgomery, Ala., general contractor; reinforcing bars, Northern Steel Co., Medford, Mass.

500 tons, office building, Retail Credit Co., Atlanta, Ga., to Bremen Steel Co. (structurals) and Southern General Fireproof Co. (bars), Atlanta, Ga.; Beers Construction Co., Atlanta, general contractor.

300 tons, junior-senior high school, Old Saybrook, Conn., to Berlin Construction Co., Berlin, Conn. (structurals); Jones & Laughlin Steel Corp., Pittsburgh (reinforcing); Torrington Building Co., Torrington, Conn., general contractor.

258 tons, Washington state railroad overcrossing, Spokane, Wash., to American Bridge Division, U. S. Steel Corp., Portland, Oreg.; Clifton & Applegate, Yardley, Wash., general contractor, low at $290,850.

200 tons, hangar and other structures, Galena, Alaska, to Maxwell Steel Co., Ft. Worth, Tex.; Peter Kiewit Sons Co., Seattle, general contractor, low at $4,812,102.

STRUCTURAL STEEL PENDING

9000 tons, including gates, U. S. half of a powerhouse to be erected on Barnhart Island in the St. Lawrence river near Massena, N. Y.; low bids of $36,229,760 on general contract submitted jointly to the New York State Power Authority, 65 Liberty St., New York, by the Savin Construction Corp. and the Merritt-Chapman & Scott Corp., New York; bids on the Canadian part of the project will be taken early in May.

525 tons, junior and senior high school, Delaware county, Pa.; Wallace Engineering Co., Bryn Mawr, Pa., low on general contract.

425 tons, Ferry Point international bridge, Calais, Me.-St. Stephen, N. B.; bids May 4, State Highway Department, Augusta, Me.

400 tons, structures at Hanford, Wash. works; bids in.

400 tons, high school, Shamokin, Pa.; C. F. King Construction Co. low on general contract.

300 tons, maintenance hangars and shops, Ladd and Elmendorf air bases, Alaska; bids to U. S. Engineer, Seattle, May 18.

285 tons, state bridge over the Maine Central railroad, Winthrop, Me.; H. E. Sargent Inc., Stillwater, Me., general contractor.

195 tons, state bridge, Franklin county, Pa.; bids May 13.

175 tons, Henry Clay Research Laboratory, Du Pont interests, Wilmington, Del.; bids closed.

175 tons, substation, Bureau of Reclamation, Missouri Basin project, near Fargo, N. Dak.

125 tons, 2-span WF beam bridge, Shelburne, Vt.; bids in to State Highway Department, Montpelier, Vt.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1165 tons, 11 bridges, Massachusetts turnpike, Framingham - Natick - Wayland, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through J. F. White Construction Co., Cambridge, Mass., general contractor.

600 tons, antiaircraft defense installations for Providence, R. I., Foster, R. I., and

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Background every phase of operations, ability to direct, administer, and build enthusiastic team. Have organized and executed sales programs to increase volume and profit. Can coordinate Shop, Office and Sales Activities. College graduate. Locate anywhere.
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CLASSIFIED

Help Wanted

TOOL STEEL SALESMAN

Prominent independent distributor wants experienced tool steel salesman preferably with established following in New York-New Jersey area. Reply in confidence, advising experience, qualifications and salary expected. Reply Box 247, STEEL, Penton Building, Cleveland 13, Ohio.

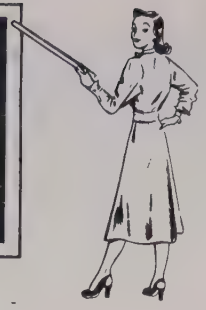
SALES ENGINEER

Engineer, metallurgical or mechanical, age 30-45, for sale of fabricated steel products to open hearth plants. Should be familiar with furnace construction and operation. Fuel engineering or furnace operation background preferred. Pittsburgh district. Permanent position with nationally known company. Excellent chance for advancement. All replies held in strictest confidence. Send resume to Box 249, STEEL, Penton Building, Cleveland 13, Ohio.

Positions Wanted

STRUCTURAL SUPERINTENDENT thoroughly familiar with all phases of operation including Engineering, Cost, Accounting, desires similar position preferably in South or Southwest. Reply Box 248, STEEL, Penton Building, Cleveland 13, Ohio.

Any Way You Figure It...
STERLINGS COST LESS PER YEAR



You want to reduce your material transport costs? You can do it easily with Sterling Wheelbarrows. They are engineered and built for the tough jobs. All steel . . . all welded . . . no rivets . . . barrows so ruggedly constructed, they seem to last forever. The unusually long service life of Sterling Wheelbarrows protects your initial investment. And maintenance costs are almost nil. Compared to other barrows, Sterlings actually cost less per year. Get the facts. Write for catalog.

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Sterling WHEELBARROWS

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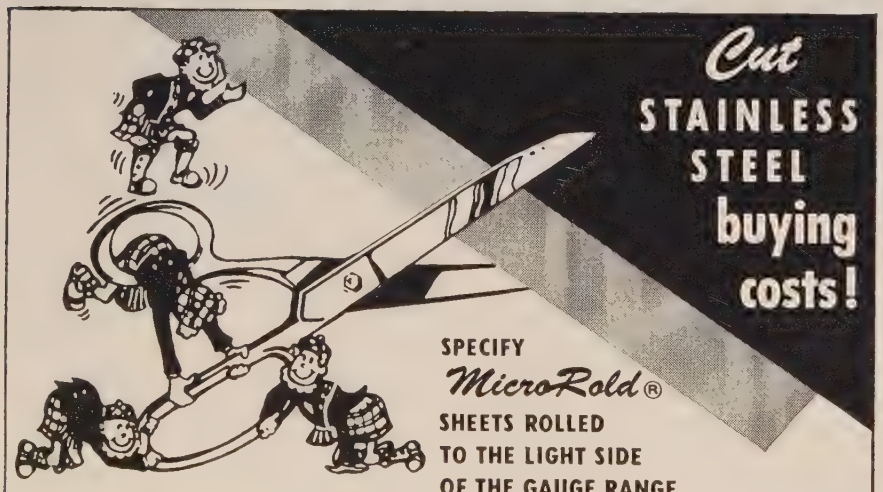

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Washington Steel's production methods provide new economies in the purchase of stainless sheet. The controlled accuracy of gauge in the rolling process gives you more area per ton or the equivalent area with lesser weight. This close adherence to specified gauge also results in longer die life.

Washington Steel CORPORATION
WASHINGTON, PENNSYLVANIA

Your steel warehouse distributor will gladly tell you the Micro-Rold Story.

Rehoboth-Seekonk, Mass., to Northern Steel Co., Medford, Mass., through Gilbane Building Co., Providence, R. I., general contractor.

585 tons, Westfield river bridge, Massachusetts turnpike, Russell-Montgomery, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Daniel O'Connell's Son Co. Inc., Holyoke, Mass., general contractor.

510 tons, school, Manchester, Conn., to Scherer Steel Co., Hartford, Conn., through M. S. Kelleher Co., Boston, general contractor.

500 tons, two residence halls, Washington State College, Pullman, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; James I. Barnes, Seattle, general contractor, low at $1,578,980.

330 tons, refrigeration and fish processing plant, Quincy market, Gloucester, Mass., to Concrete Steel Co., Boston, through F. W. Cunningham Co., Boston, general contractor.

240 tons, St. Anthony's friary building, Hudson, N. H., to Bethlehem Steel Co., Bethlehem, Pa., through John Bowen Co., Boston, general contractor.

185 tons, Josslyn Teaching Clinic, Roxbury district, Boston, to Northern Steel Co., Medford, Mass., through John A. Volpe Construction Co., Malden, Mass.

100 tons, military installations, Big Delta and Galena, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

85 tons, Washington state, two bridges, Spokane county, to Joseph T. Ryerson & Son Inc., Spokane, Wash.

REINFORCING BARS PENDING

2500 tons, Seward, Alaska, ocean terminal; bids opened Apr. 21.

400 tons, treatment plant, Ft. Lewis, Wash.; Ostruske-Murphy Co., Tacoma, Wash., low at $457,861 to U. S. Engineer, Seattle.

225 tons, Washington state underpass, Thurston county; bids to Olympia, Wash., May 3.

212 tons, Washington state overcrossing, Spokane, Wash.; general contract placed.

100 tons, including concrete pipe and miscellaneous metal; pumping plants, laterals, pipe lines, Bureau of Reclamation project; bids to Rupert, Idaho, May 10.

100 tons, laterals, pumping plants, etc., Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., May 18.

PLATES . . .

PLATES PENDING

1440 tons, hull, medium tensile, black, grade M; bids in to General Stores Supply, Navy, Philadelphia.

400 tons, two 400,000-gal water tanks, Newton, Mass.; bids and plans likely in May.

150 tons, 400,000-gal elevated tank, neuropsychiatric hospital, Topeka, Kans., Veterans Administration, Washington.

100 tons, 250,000-gal elevated water tank, hospital, Carswell Air Field Base, Ft. Worth, Tex.; bids June 7, Corps of Engineers, Ft. Worth.

PIPE . . .

STEEL PIPE PENDING

Unstated, 13,000 feet, 4 and 4½-in. pipe system and cribs, for waste; bids to Atomic Energy Commission, Richland, Wash., May 3.

RAILS, CARS . . .

RAILROAD CARS PLACED

Delaware, Lackawanna & Western, conversion of 84 hopper cars into flatcars for piggyback service, to the company's own shops in Scranton, Pa.

Louisville & Nashville, 200 fifty-ton pulpwood cars, to ACF Industries, New York.

North American Car Corp., 55 seventy-ton covered hopper cars to Pullman-Standard Car Mfg. Co., Chicago.

Rock Island, 100 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Southern Pacific, 350 covered all-welded hopper cars, to unnamed builder.

Texas & Pacific, 150 fifty-ton boxcars and 50 fifty-ton flatcars, to its own shops at Marshall, Tex., for construction in 1956.

Western Maryland, 50 fifty-ton boxcars to General American Transportation Corp., Chicago.

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WARD STEEL CO.

We specialize in
FINISHED STEEL
BARS—TUBES—STRIP

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Most Complete Stock in America of
BLUE TEMPERED SPRING STEEL

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WITH
GRANODRAW®
FACILITATES
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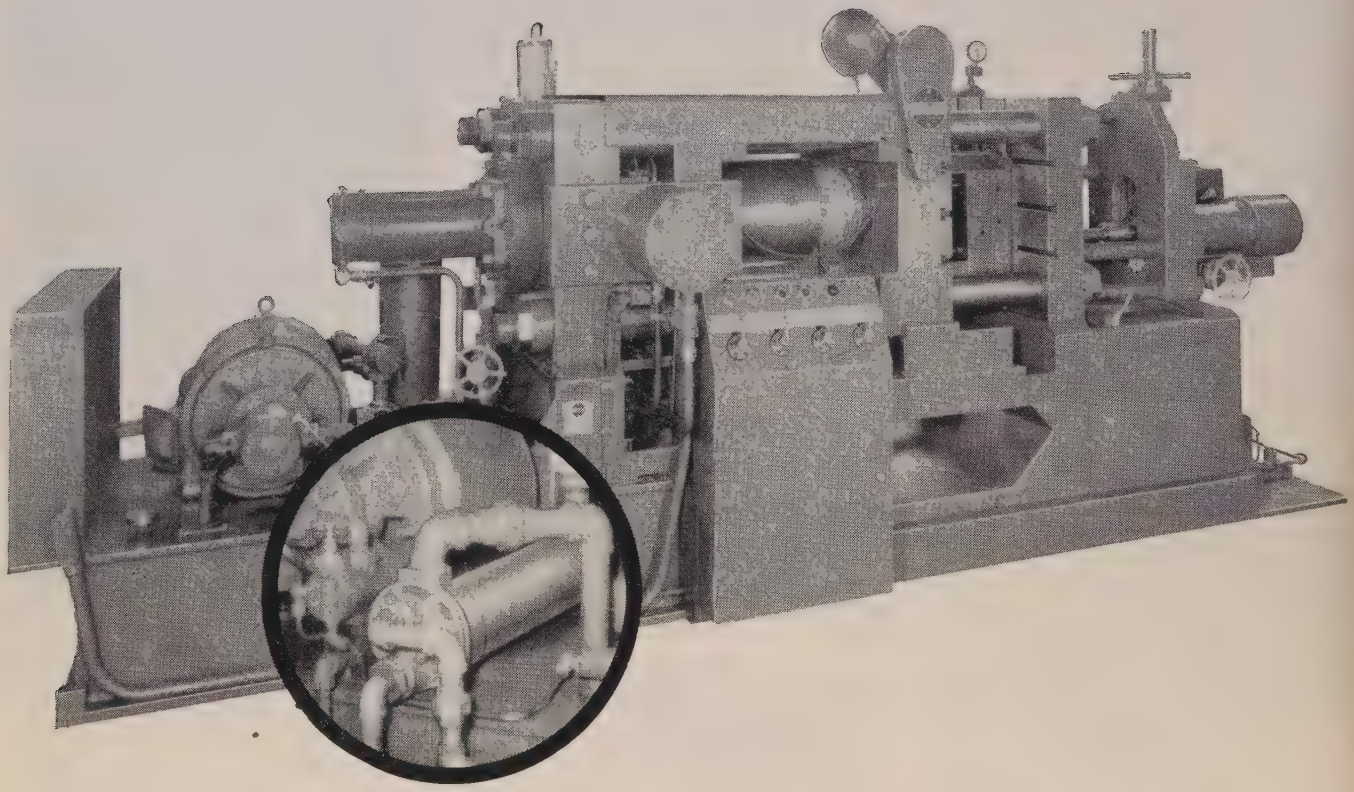
OPERATIONS

The drawing of wire, bars, tubing, stampings, shells, shell cases, cold heading, and many other cold forming operations—including the cold extrusion of steel—are greatly facilitated by the application of a "Granodraw" zinc phosphate coating and a suitable lubricant prior to working.

Write for Descriptive Folder
AMERICAN CHEMICAL PAINT CO.
AMBLER, PA.
Detroit, Mich. Niles, Calif. Windsor, Ont.

"Ross Exchanger important to efficiency of hydraulic system"

. . . SAYS CUYAHOGA



With a rated locking pressure of 500 tons plus, this Wedgelock Model A-32-10 Die Casting Machine has been designed to turn out aluminum castings weighing up to 7 lbs.

To insure full pump capacity of 17.5 gpm at 1000 psi, by preventing slippage from overheated, thinned oil, a Ross Type BCF Exchanger is furnished. It keeps hydraulic oil at proper temperature — "an important part in the efficient operation of the hydraulic system and the machine," says Cuyahoga Industries, manufacturer of Wedgelock machines.

Because of their extreme ruggedness and high thermal efficiency, Ross Type BCF Exchangers are regularly installed to safeguard performance of numerous types and makes of hydraulic machinery. Pre-engineered, fully standardized and constructed entirely of non-ferrous materials, they are stocked in a wide range of sizes to answer most requirements immediately.

For more details, request Bulletin 1.1K5.

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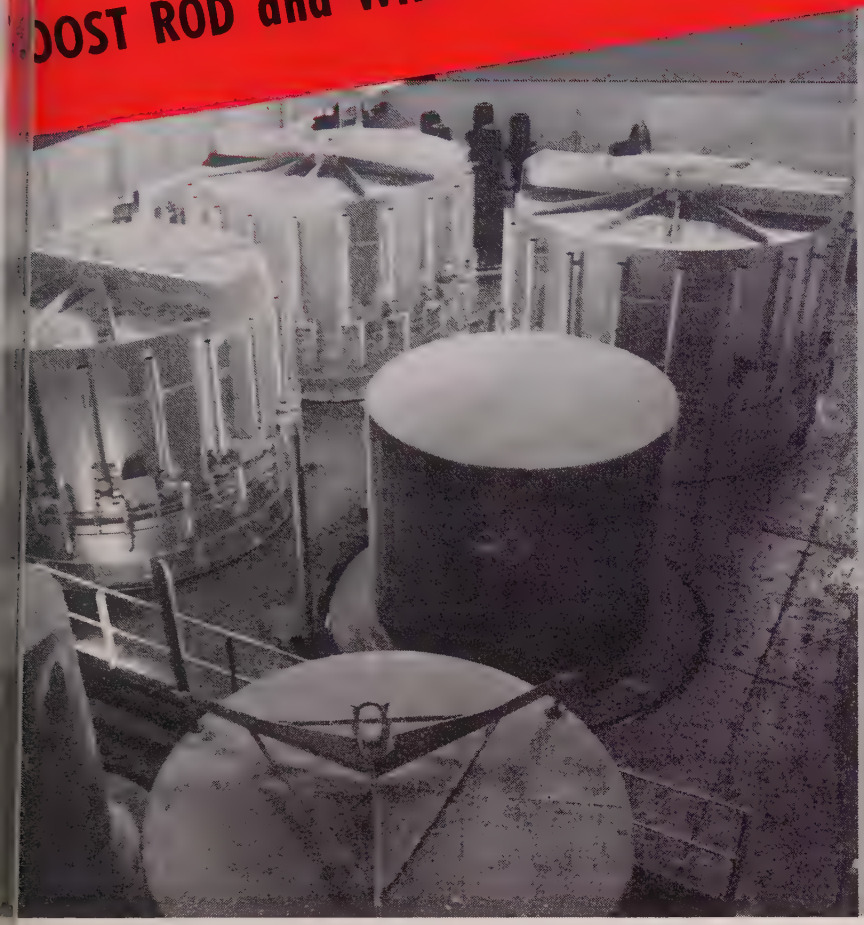
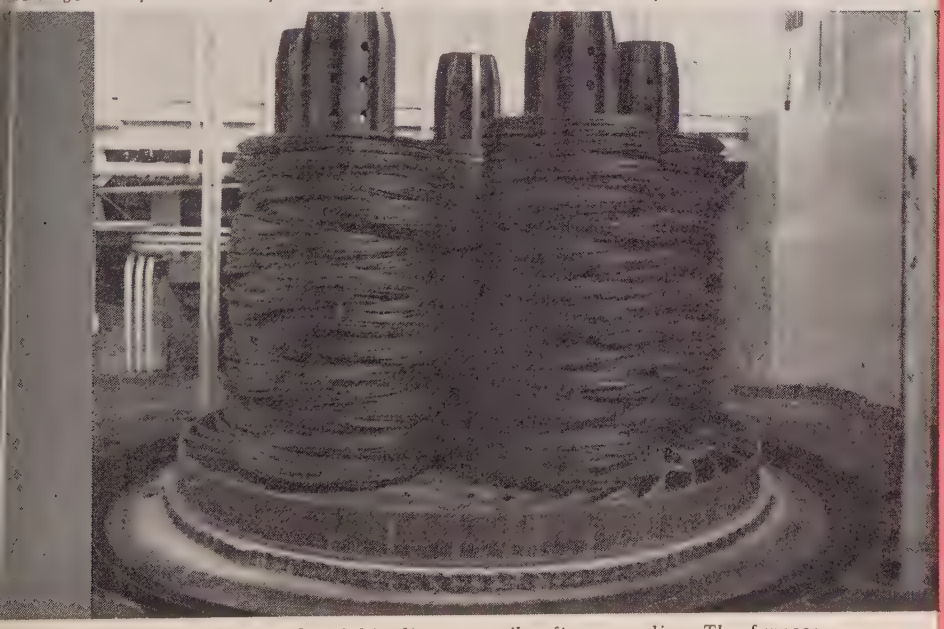
PER BELL TYPE ANNEALING FURNACES
OOST ROD and WIRE PRODUCTION — IMPROVE QUALITY



t diameter circular radiant tube annealing furnace in operation today was recently up at one of the nation's foremost rod and wire manufacturers. It consists e huge 108" furnaces and five bases. This same concern has more of these on order.



Five stacks of 34" diameter coils after annealing. The furnace is large enough for three stacks of 48" diameter rod coils.

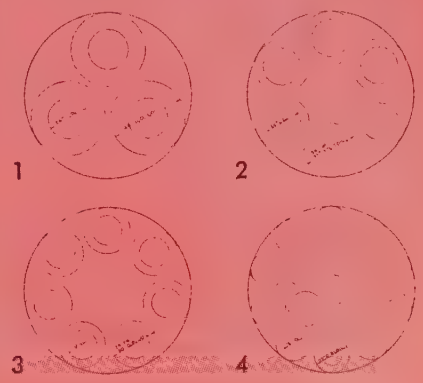
Big 108" diameter furnaces that will hold three stacks of 48" diameter rod coil were recently set into operation by one of America's leading rod and wire makers to step up production of these new larger coils. Designed and built by Lee Wilson, the nation's foremost manufacturer of radiant tube, bell type annealing furnaces, the units are the largest of their kind in commercial production today.

After the shakedown runs the manufacturer called the equipment "highly satisfactory," and scheduled similar furnaces for a second plant. The furnaces not only gave this manufacturer the capacity he wanted, but stepped up BTU intake and special diffuser assemblies, gave him faster anneals of greatly improved quality.

If you process wire or rod, you'll want the full story of these big, modern, high production units. Simply write Lee Wilson Engineering and a qualified Lee Wilson engineer will call on you at your convenience.

CHARGE PATTERNS

CHARGE VERSATILITY is emphasized by these typical loading patterns. Regardless of coil size, you can take full advantage of this 108" diameter base.



TABLE

Load	Coil Size	No. Stems per Charge	Weight per Stem	Total Charge (Lbs.)
No. 1	Rods (48")	3	6000	18,000
No. 2	26" Block 35" OD x 24" ID	6	4500	27,000
No. 3	22" Block 29" OD x 19" ID	7	4500	31,500
No. 4	16" Block 22" OD x 13" ID	15	2500	37,500

Lee Wilson

ENGINEERING COMPANY, Inc.

20005 West Lake Road, Cleveland 16, Ohio

Slits, coils 1/8" steel at high speeds

... with cutters on TIMKEN® bearings

STEEL of ⅛-inch thickness is slit and coiled at high speeds by this Stamco 60" Coil Slitter. To carry the heavy loads and to keep the cutters aligned, Stamco mounts the cutter arbors on Timken® tapered roller bearings. And to assure a smooth, even transmission of power, all gear reduction units are mounted on Timken bearings.

Line contact between the rollers and races of Timken bearings gives them extra-carrying capacity. And their tapered design enables them to take both radial and thrust loads in any combination. Cutter arbors are kept in positive alignment, insuring precise slitting even at high speeds (on light-gauge steel up to 2,200 feet per minute).

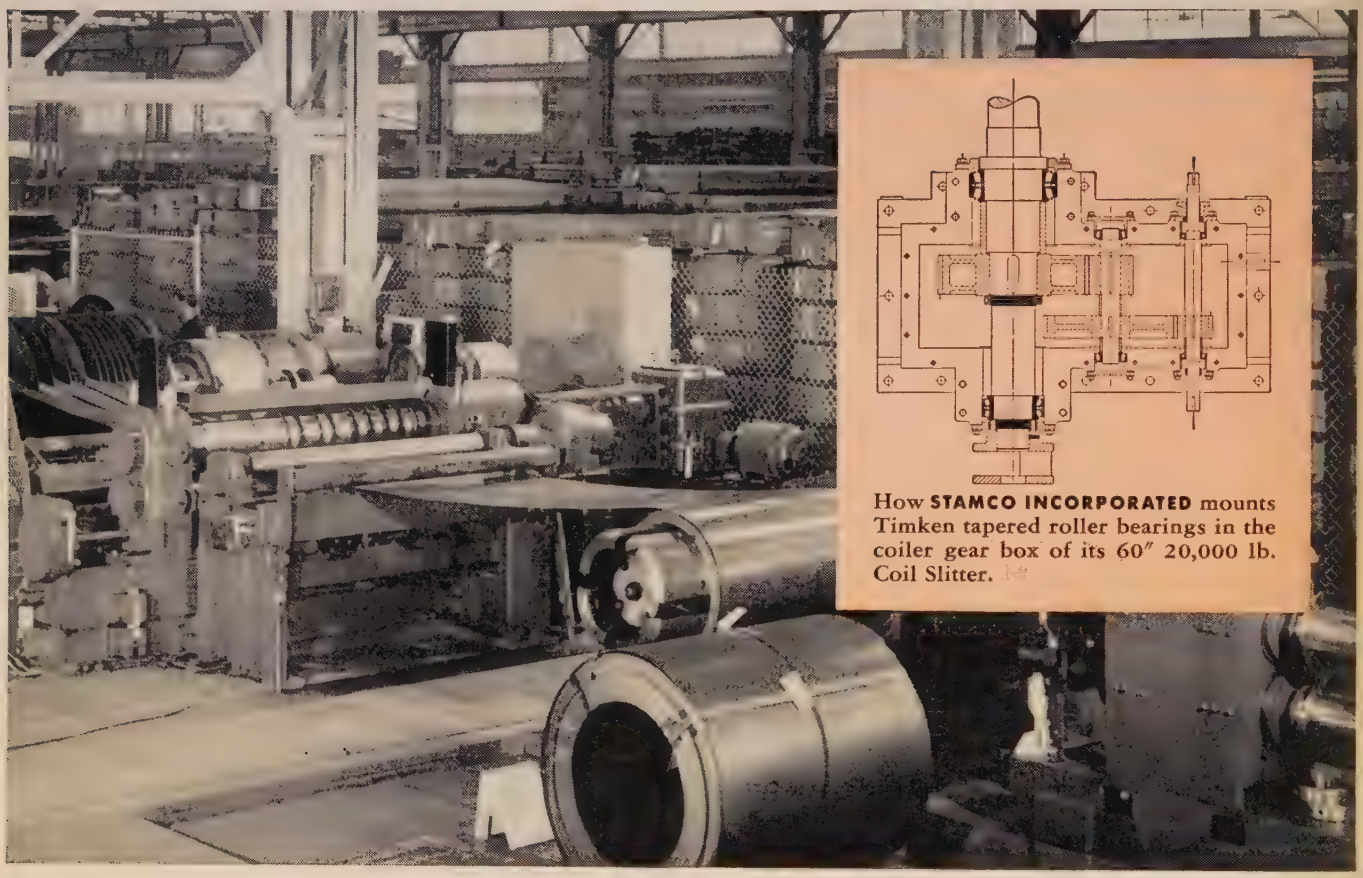
Because reducer shafts are also held in rigid alignment, gears mesh accurately to give a smooth flow of power, less gear wear, less maintenance. Power loss is further reduced because the true rolling motion and smooth surface finish of Timken bearings make friction negligible.

These bearings are made of the finest steel ever developed for bearings—Timken fine alloy steel. We have to make it ourselves because that is the only way we can get steel good enough for Timken bearings. They normally last the life of the coil slitter.

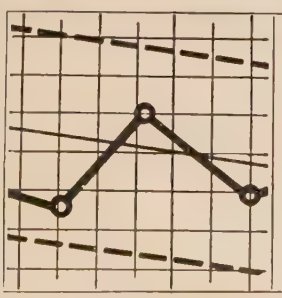
No other bearing gives you all the advantages you get with Timken bearings. Specify them for all the machines you build or buy. Look for the "Timken" trade-mark on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.



How **STAMCO INCORPORATED** mounts Timken tapered roller bearings in the coiler gear box of its 60" 20,000 lb. Coil Slitter.



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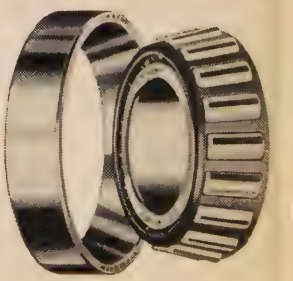
To insure uniform high quality and closer tolerances, the Timken Company uses statistical quality control. With it, tolerance deviations are plotted graphically. It's one of industry's newest, most scientific methods of improving product uniformity.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ↕ AND THRUST → LOADS OR ANY COMBINATION